FEBRUARY 23, 1935.

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.
Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229

No. VIII. OF VOL. I., 1935. LONDON, SATURDAY, FEBRUARY 23, 1935. Pp. 120—Price 1s.
No. 5817. VOL. CCXXVIII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 10s.

OXFORD MEDICAL PUBLICATIONS.

SEE PAGE 2

MELANCHOLIA IN EVERYDAY PRACTICE.
CLINICAL TYPES—DIAGNOSIS—TREATMENT.
By EDWIN L. HOPEWELL-ASH, M.D.
"Written clearly. . . . We can recommend it."
—GUY'S HOSP. GAZ.
"A book of tremendous value."
—CAMB. UNIV. MED. SOC. MAG.
"This volume is especially valuable."—M'SEX. HOSP. JOURNAL.
"A book we can thoroughly recommend."—MEDICAL TIMES.
"A most valuable contribution."—MEDICAL WORLD.
"Should help the practitioner."—CLINICAL JOURNAL.
"An excellent, concise and lucid guide."—QUEEN'S MED. MAG.
"Thoroughly practical."—BRIT. JOUR. OF INEBRIETY.
"An authoritative handbook."—
—THE NONESUCH (UNIV., BRISTOL).
London: Bale, Sons and Danielsson. Pp. 136. 7s. 6d. net.

AIDS TO EMBRYOLOGY.
By R. H. HUNTER, M.D., M.Ch., Ph.D., Lecturer in Anatomy, Queen's University, Belfast.
SECOND EDITION. Pp. viii + 172, with 39 illustrations.
Price 3s. 6d. Postage 3d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

BY W. SAMPSON HANDLEY, M.S. LOND., F.R.C.S., Surgeon to the Middlesex Hospital.

CANCER OF THE BREAST AND ITS TREATMENT.
Second Revised Edition. With 82 Illustrations. 30s. net.
(John Murray.)

THE GENESIS OF CANCER: A STUDY OF THE GENETIC RELATIONSHIP OF LYMPH-STASIS AND CANCER.
Just Published. 113 Illustrations. 21s. net.
(Kegan Paul, Anglo-French Library.)

DISEASES OF THE THYROID GLAND
WITH SPECIAL REFERENCE TO THYROTOXICOSIS.
By CECIL A. JOLL, M.S., B.Sc., F.R.C.S. (Eng.).
Crown 4to. Fully Illustrated. £3 3s. net.
"Mr. Joll has presented his fellow practitioners and students with a monumental volume. They need not trouble to search the literature published up to the time this volume went to press, for they will find everything relevant within its covers."
—BRITISH JOURNAL OF SURGERY.
William Heinemann (Medical Books) Ltd., 99, Great Russell-street, London, W.C.1.

ALL FRENCH MEDICAL WORKS AND PERIODICALS.
Catalogues and full information direct from
The United French Publishers,
120, Boulevard Saint-Germain, Paris VI.

NEW (FOURTH) EDITION. Completely rewritten. 10s. 6d. net.
TREATMENT OF DISEASES OF THE SKIN.
By KNOWSLEY SIBLEY, M.A., M.D., B.Ch. (Camb.).
London: Edward Arnold & Co., 41 and 43, Maddox-street, W.1.

THREE NEW BOOKS.

CLINICAL METHODS.
By ROBERT HUTCHISON, M.D., F.R.C.P., and DONALD HUNTER, M.D., F.R.C.P.
Tenth Edition. *Revised throughout.* 12s. 6d. net.

DISEASES OF THE SKIN.
By S. ERNEST DORE, M.A., M.D., F.R.C.P. Lond., and JOHN L. FRANKLIN, M.A., M.D., M.R.C.P.
Crown 8vo, 420 pages, with 46 Half-Tone Plates. 10s. 6d. net.
"The authors have succeeded in presenting an almost complete review, in an astonishingly small compass, of the three hundred or so disorders by which the skin may be affected."—PRACTITIONER.

SURGICAL APPLIED ANATOMY.
By Sir FREDERICK TREVES, Bart.
Revised by Professor C. C. CHOYCE, C.M.G., C.B.E., M.D., F.R.C.S.
New (Ninth) Edition. *Completely Revised.*
Foolscap, 8vo, 720 pages, with 174 Illustrations, 66 in Colour. 14s. net.
"As a concise and readable summary of the facts of applied surgical anatomy it remains, after fifty years, without a rival."
BRITISH MEDICAL JOURNAL.
Cassell & Co., Ltd., La Belle Sauvage, London, E.C.4.

FRACTURES.
By MEURICE SINCLAIR, C.M.G., M.B., CH.B. (EDIN.).
With an Introduction by Sir ROBERT JONES, Bt., F.R.C.S.
Pp. 550. 337 X ray photographs, photographs and diagrams. 24s. net.
Constable & Co., Ltd., London.

¶ *"This book should certainly make and keep for itself a place in urological literature."*—LANCET.

UROLOGY IN WOMEN:
A HANDBOOK OF URINARY DISEASES IN THE FEMALE SEX.
By E. CATHERINE LEWIS, M.S. (Lond.), F.R.C.S. (Eng.), Surgeon to the Royal Free Hospital, Surgeon and Urologist to the South London Hospital for Women.
Size 6¼ × 8¼. Pp. viii + 73. With 4 Coloured Plates and 23 other Illustrations. Price 6s.; postage 5d.; abroad 9d.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2.

NOW READY. SECOND EDITION.
DISEASES OF THE RECTUM AND COLON
AND THEIR SURGICAL TREATMENT.
BY
J. P. LOCKHART-MUMMERY,
F.R.C.S. ENG., M.A., M.B., B.C. CANTAB.,
Senior Surgeon to St. Mark's Hospital.
Pp. viii + 616, with 247 Illustrations. Price 35s.
Baillière, Tindall & Cox, 7 & 8, Henrietta-street, London, W.C.2

The Recent Advances Series

MEDICINE
By G. E. BEAUMONT, D.M., F.R.C.P., and E. C. DODDS, M.V.O., M.D., F.R.C.P.
7th Edition. 58 Illustrations. 12s. 6d.

ALLERGY (Asthma, Hay-fever, Eczema, Migraine, etc.)
By G. W. BRAY, M.B., Ch.M., M.R.C.P. 2nd Edition.
106 Illustrations, including 4 Coloured Plates. 15s.

NEUROLOGY
By W. RUSSELL BRAIN, D.M., F.R.C.P., and E. B. STRAUSS, D.M., M.R.C.P., 3rd Edition. 40 Illustrations. 15s.

PATHOLOGY
By GEOFFREY HADFIELD, M.D., F.R.C.P., and LAWRENCE P. GARROD, M.D., M.R.C.P. 2nd Edition. 69 illus. 15s.

VACCINE AND SERUM THERAPY
By ALEXANDER FLEMING, M.B., F.R.C.S., and G. FORD PETRIE, M.D. 5 Illustrations. 15s.

Detailed Brochures on application.
London: J. & A. CHURCHILL, Ltd., 40 Gloucester Place, W.1

Elixir mo-Valerianate (Gabail)

exhibits a desirable sedative and soporific effect in all cases of

NERVOUS INSOMNIA

gently and safely inducing natural sleep without the attendant risk of the barbituric derivatives.

Samples on request

Soporific dose: Two tablespoonfuls at bedtime.

THE ANGLO-FRENCH DRUG CO. LTD., 11 & 12, Guilford Street, LONDON, W.C.1

Dyspepsia after Tea!

Here is one of the many hundreds of Medical testimonials as to the value in Dyspepsia of **"Ty.phoo"** tea, with its rich mild "leaf-edge" preponderance.

"I was troubled with dyspepsia and found that my habit of drinking about six cups of ordinary tea per diem was responsible. I decided to try 'Ty.phoo' tea and since using it I have had absolutely no dyspepsia, in spite of the fact that I drink as much if not more than I used to."

A large free sample of "Ty.phoo" tea will be posted to any practitioner who has not tried it.

Over 16,000 Doctors are direct purchasers of this tea from us.
Sumner's **"Ty.phoo"** Tea, Ltd., *Medical Dept. L.* Birmingham, 5.

FOR THE TREATMENT OF

CONJUNCTIVITIS, PAINFUL & TIRED EYES, & PINK EYE

PHENOLAINE EYE DROPS

Formula:

Phenolaine	Minims 2
Sodium Chloride	Grains 4
Water	Ounces 1

Phenolaine is antiseptic and anæsthetic, so that the conjunctiva is not only rendered insensitive, but the infecting organism is also destroyed.

This antiseptic anæsthetic is a very soothing solution for all forms of conjunctivitis, inflamed and painful eyes, or any form of eye discomfort. It can be used in cases of glaucoma, and there is no effect on the pupil or accommodation. The drops may be used daily for years without any harmful effect on the cornea.

SAMPLES OBTAINABLE FROM:

THE PHENOLAINE COMPANY, 43 Brewer Street, Piccadilly, W.1.

Gerrard: 4741.

FEBRUARY 23, 1935

THE LANCET

A JOURNAL OF BRITISH AND FOREIGN MEDICINE, SURGERY, OBSTETRICS, PHYSIOLOGY, CHEMISTRY, PHARMACOLOGY, PUBLIC HEALTH, AND NEWS

No. 5817 LONDON, SATURDAY, FEBRUARY 23, 1935 CCXXVIII

CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT

ADDRESSES AND ORIGINAL ARTICLES

Place of Surgery in Treatment of Peptic Ulcer. By W. H. OGILVIE, F.R.C.S..... 419
Renal Sympathectomy and Renal Sympathetico-tonus. By S. H. HARRIS, F.R.A.C.S.—(*Illustrated*) 424
Sinusitis in Mental Disorder. By D. N. PARFITT, M.D., D.P.M. 429
Relative Food Values of Glucose and Sucrose. By S. W. COLE, M.A... 431
"Prostigmin" in Treatment of Myasthenia Gravis. By E. A. BLAKE PRITCHARD, M.R.C.P.—(*Illustrated*)..... 432

MEDICAL SOCIETIES

Royal Society of Medicine: Section of Obstetrics and Gynæcology.—Sterilisation of Women 435

REVIEWS AND NOTICES OF BOOKS

Physical and Mental Growth of Prematurely Born Children. By Prof. J. H. Hess, M.D., and others 438
Principles in the Treatment of Inflammation. By T. E. Hammond, F.R.C.S. 438
Psychopathology. By J. E. Nicole, L.M.S.S.A., D.P.M. 438
Adolescence and Marriage. By R. V. Storer, M.R.C.S. 439
Fit or Unfit for Marriage. By Th. H. Van de Velde, M.D. 439
Developmental Anatomy. By Prof. L. B. Arey.... 440
Manual of Practical Anatomy. By Prof. T. Walmsley, M.D..... 440
Anatomy of Surgical Approaches. By Prof. L. C. Kellogg, M.D. 440
Aids to Osteology. By P. Turner, F.R.C.S., and N. L. Eckhoff, F.R.C.S. 440
Introduction to Experimental Embryology. By G. R. de Beer, M.A..... 440
British Journal of Tuberculosis..... 440

LEADING ARTICLES

MUNICIPAL MIDWIFERY SERVICE 441
OPERATIONS ON THE GALL-BLADDER..... 442
SILICOSIS IN COAL-MINERS 443

ANNOTATIONS

Dextrose versus Sucrose.. 444
Pharmacological Research 444
Radiographical Innovations 444
Dynamics of the Cerebro-spinal Fluid 445
"Homeostasis" 445
The Nephrotic Syndrome.. 446
Onodi Collection Catalogued 446
Failure in Breast-feeding.. 447
Types of Depressive Psychoses 447
Milk-borne Epidemics 448
A Remedy for Myasthenia 448

PROGNOSIS

XLI.—Prognosis in Prematurity. By ALAN MONCRIEFF, F.R.C.P. .. 449

THE SERVICES

Royal Naval Volunteer Reserve.—Royal Army Medical Corps.—Royal Air Force.—Indian Medical Service.—Deaths in the Services..... 450

NEW INVENTIONS

Combined Tongue Depressor and Tonsil Evertor. By C. G. Gibson, M.B.—(*Illustrated*) 440

SPECIAL ARTICLES

Immunisation Experiments on Calves with B C G. By A. STANLEY GRIFFITH, M.D., Prof. J. BASIL BUXTON, F.R.C.V.S., and R. E. GLOVER, F.R.C.V.S..... 451
Organised Service of Midwives 457
Medicine and the Law: Drawbacks of Workmen's Compensation Law.—Damages for Puerperal Fever 459
Scotland: Public Medical Service 460
Infectious Disease in England and Wales 463

CORRESPONDENCE

Period of Incapacity in Fractures (Mr. J. Hosford, F.R.C.S.) 461
Uterine Contraction (Dr. S. R. M. Reynolds)..... 461
Diagnosis of Vitamin-C Subnutrition by Urine Analysis (Mr. L. J. Harris, D.Sc.) 462
"Secondary Marble Bones" (Dr. J. F. Brailsford).... 462
Body-weight in Relation to Disease (Dr. H. Gardiner-Hill) 462
Medical Psychologists Needed in the North.... 462
Skin Lesions Associated with the Wisdom Tooth (Mr. C. Bowdler Henry, M.R.C.S., L.D.S.)..... 463
What is Malnutrition? (Dr. F. T. H. Wood).... 463

OBITUARY

Daniel Colquhoun, F.R.C.P. 464
Daniel Drake Lee, M.D... 464
George Rice, M.B..... 464
Milner Montgomery Moore, M.D. 464
The late Dr. James Collier 464

PARLIAMENT

Notes on Current Topics: Unemployment Relief Regulations 465
House of Commons: Local Authorities' Building Programme.—Maternal Mortality.—Inquiry into Nutrition of Children.—Epithelio-matous Cancer.—Deaths from Anæsthetics 465

MEDICAL NEWS

Roy. Coll. Surg. Eng..... 467
Society of Apothecaries... 467
International Society of Surgery 468
Hunterian Society 468
Conference on Meat..... 468
North Kensington Women's Welfare Centre 468
University of Manchester.. 469
Food Education Society.. 469
Fracture Units at Hospitals 469
A Congress on Thalasso-therapy 469
Medical Practice in China 469
Sir Charles Hastings Lecture 469
Course on Mental Deficiency 469
A Library of Orthopædic Surgery 469
Blackpool Hospital 469
Course in Plastic Surgery.. 469
Microchemical Club..... 469
Lady Tata Memorial Research Scholarships.. 469
Maternity and Child Welfare Conference 469
Incineration of Refuse.... 469

INDEX NOTICE

THE LANCET, Vol. II., 1934 470

NOTES, COMMENTS, AND ABSTRACTS

National Council for Mental Hygiene 472
Enrico Bottini..... 472
Price of Insulin..... 472
An Infra-red Generator... 472

Medical Diary 470
Appointments 471
Vacancies 471
Births, Marriages, Deaths 471

JUST PUBLISHED

Second Edition. 113 New Figures. In One Volume.
With 731 Illustrations (84 Coloured). Demy 8vo. Pp viii+988. **30s.** net; postage 9d.

A SHORT PRACTICE OF SURGERY

By **HAMILTON BAILEY**, F.R.C.S.Eng., Surgeon, Royal Northern Hospital, London, etc. *and* **McNEILL LOVE**, M.S.Lond., F.R.C.S.Eng. Surgeon, Royal Northern Hospital, London, etc.

"... the whole domain of surgery is covered in a useful and instructive manner ... a readable and well-illustrated volume."—*The Medical Press.*

With 80 Illustrations. Demy 8vo. **9s.** net; postage 9d.

INJURIES AND THEIR TREATMENT

By **W. ELDON TUCKER**, M.A., B.Ch., F.R.C.S., Surgeon at St. John's Hospital, Lewisham; Surgeon to the London Clinic for Injuries, etc. With a Foreword by Sir HUMPHRY ROLLESTON.

PUBLISHERS' NOTE. The author has endeavoured to put clearly the most useful methods of dealing with recent injuries, and has at the same time laid great stress on the importance of immediate treatment even in apparently simple cases.

London: H. K. LEWIS & CO. LTD., 136 Gower Street, W.C.1

OXFORD MEDICAL PUBLICATIONS

A PRACTICAL MANUAL OF

DISEASES OF THE CHEST

By MAURICE DAVIDSON, M.A., M.D. (Oxon.), F.R.C.P. (Lond.)

Physician to the Brompton Hospital for Consumption and Diseases of the Chest (sometime Dean of the Brompton Hospital Medical School); Physician to the Miller General Hospital for South-East London; Consulting Physician to St. Luke's Hospital, Chelsea.

Pp. 540. 199 Illustrations (1 Colour Plate). **42s.** net.

A MANUAL OF

OBSTETRICAL AND GYNAECOLOGICAL PATHOLOGY

By the late JOHN H. TEACHER,
Edited by ALICE J. MARSHALL, M.B.

WITH CONTRIBUTIONS FROM ROBERT CRUICKSHANK, JAMES HENDRY, ELINOR D. JACKSON RUTHERFURD, W. FLETCHER SHAW, MATTHEW J. STEWART, AND GILBERT I. STRACHAN.

Pp. 426. 316 Illustrations (2 Colour Plates). **45s.** net.

X-RAY INTERPRETATION

By H. CECIL H. BULL, M.A., M.B., M.R.C.P.

Physician and Hon. Radiologist, Royal Waterloo Hospital, London; Hon. Radiologist, Southend-on-Sea General Hospital.

Pp. 412. 280 Illustrations. **21s.** net.

VOLUNTARY STERILIZATION

By C. P. BLACKER, M.D., M.R.C.P.

General Secretary of the Eugenics Society

Pp. 146. **5s.** net.

INDUSTRIAL MALADIES

By the late SIR THOMAS LEGGE,

H.M. Senior Inspector of Factories and Medical Adviser to the Trades Union Congress.

Edited by S. A. HENRY, M.A., M.D., D.P.H. (Cantab.), D.T.M. (Liverpool)

H.M. Medical Inspector of Factories.

Pp. 247. 13 Illustrations (2 in Colour). **12s. 6d.** net.

HEAD INJURIES

By L. BATHE RAWLING, M.B., B.Ch., F.R.C.S.

Consulting Surgeon to St. Bartholomew's Hospital, and to the West End Hospital for Nervous Diseases.

Pp. 86. 38 Illustrations. **7s. 6d.** net.

COMPLETE CATALOGUE OF MEDICAL BOOKS FREE ON REQUEST

Oxford University Press

HUMPHREY MILFORD AMEN HOUSE LONDON, E.C.4

ADDRESSES AND ORIGINAL ARTICLES

THE PLACE OF SURGERY IN THE TREATMENT OF PEPTIC ULCER*

By W. H. Ogilvie, M.Ch. Oxon., F.R.C.S. Eng.
SURGEON TO GUY'S HOSPITAL

The greatest of physicians has said of medicine that "its art is long, but life is fleeting; experience is fallacious and judgment difficult." This difficulty is nowhere more apparent than in the problem now before us. Where then shall we look for truth?

In some branches of surgery the study of history will point the way. Tracing the development of methods of treatment we find that these have undergone a gradual process of refinement, culminating in some accepted procedure. But in the surgery of ulcer such a study leads nowhere. Every conceivable operation has been performed, and nearly all of them, in their original or a modified form, are being done in some part of the world to-day. For each success is claimed, and for each, even for the worst, a temporary success seems assured. The only conclusion that can be reached after such a review is that of Finney, that the stomach is a very viable organ.

In other surgical problems the study of statistics may afford considerable help. Statistical investigations are valuable where the problem to be explored is a fairly simple one, the investigator independent, the surgeons whose results are included of approximately equal competence, and the operation standardised. The figures published by the Ministry of Health relating to cancer of the breast afford an outstanding example of the usefulness of the statistical method, but no comparable analysis of the ulcer problem has yet been attempted, and I am doubtful whether it could be made. I shall have occasion later to refer in detail to some of the collected series that have been published, and will only observe now that the majority are open to two obvious criticisms: that the investigator is not independent in that the statistics are those of one institution or are compiled from the personal reports of several individuals; or that the number of cases traced and the period over which they have been followed up are quite inadequate. Investigation of the results of ulcer treatment differs profoundly from that of the post-operative course of malignant disease in that the estimation of success depends less upon the presence or absence of demonstrable abnormalities than on symptoms whose interpretation varies with the mentality of the patient and the observer, that relapses usually make their appearance after some years and become increasingly frequent with the passage of time, and that such relapses are accompanied by symptoms which are obviously those of the former disease, so that the disillusioned sufferer does not willingly consult his first adviser or acknowledge his requests for information. The reports of individuals are notoriously unreliable. They may afford useful guidance to the experienced and discriminating reader, but as finger-posts to the way of truth they are of little value. Those who make a practice of reading such reports are familiar with the treatment of ulcer which is announced as entirely successful one year and quietly abandoned the next.

I will therefore start with the assumption that we shall be well advised to neglect figures and consider principles. What are the causes of gastric and duodenal ulceration, and what are the effects they produce; how can we counteract these effects and remove these causes, so that we not only cure the ulcer, but prevent its recurrence?

The Causes of Peptic Ulceration

At the beginning we are faced with the difficulty that these ulcers are confined to men of civilised races living in temperate climates. They never occur naturally in animals, and they are hard to reproduce experimentally. They have been so produced, but usually by methods of gross damage that have no relation to any possible causative factor in man; moreover, these experimental ulcers are superficial and heal rapidly, and bear little resemblance to the indurated chronic ulcers we see in our patients. We must however accept the two factors of acid and sepsis as concerned in the production of ulcers.

The part played by acid is well known. In the normal alimentary tract ulcers are only seen between the cardia and the bile papilla, the portion that is exposed to the action of free hydrochloric acid. They never occur where acid secretion is congenitally absent or lost through old-standing gastritis or cancer; on the other hand, they may appear in any part of the intestine which has, by a surgical anastomosis or a fistulous opening, been brought into communication with the stomach. Peptic ulcers in man are usually found in individuals with the hypersthenic gastric diathesis characterised by high acid secretion and rapid emptying, and are prone to occur in several members of a family. Chronic ulcers similar to the human type have been produced repeatedly in animals by Mann of the Mayo Clinic by diverting the alkaline juices of the bile and pancreatic secretions to some lower part of the intestine, and anastomosing the part above to the stomach.

The factor of sepsis has long been recognised on clinical grounds. Duodenal ulcer is apt to follow burns, septicæmia, appendicitis, and many of the fevers, while gastric ulcer is seldom seen apart from oral sepsis. Cohen in 1860 produced gastric ulceration in animals by injecting pus into the circulation, and his work has been repeated by many others. More recently Rosenow has described the elective action of streptococci derived from the teeth and tonsils of ulcer patients, which causes ulcers in a high proportion of the animals in which they are injected.

Two other factors, trauma and stasis, while of lesser importance must be discussed. That trauma plays a part is suggested by the virtual limitation of ulcers of the stomach to the lesser curve, which is the main channel for the passage of food, and by their preference in the duodenum for the anterior wall one inch beyond the pylorus, a point where the gastric efflux impinges with greatest force. In Mann's experiments ulcers always appeared at a similar point in the intestine, on the anterior wall just below the anastomosis with the stomach. Stasis was shown by Bolton to be an important factor in converting acute ulcers produced by the injection of toxins into chronic lesions. The frequent association of active gastric ulcers with old duodenal stenosis again suggests that stasis has been one of the causes responsible for their appearance.

The two factors of acid and sepsis are common

* The annual address to the Oxford Medical Society, delivered at Oxford on Nov. 9th, 1934.

to gastric and duodenal ulcers. But from every other point of view these two similar and sometimes associated conditions appear to be distinct diseases, differing in their ætiology, course, and prognosis, and therefore demanding a different outlook in treatment.

Duodenal ulcer is becoming commoner, gastric ulcer rarer. Duodenal ulcer predominates in males, and especially attacks men of the vigorous, intellectual, emotional type; gastric ulcer is seen with equal frequency in both sexes, usually in people who are listless, feeble, and in comparatively poor health. Duodenal ulcer occurs in association with a short, high stomach placed transversely, rapid emptying, and high acid; gastric ulcer is usually seen in the long stomach reaching low down in the abdomen, with delayed emptying and a normal or subnormal acid curve. Apart from sepsis, no factor causing gastric ulcer stands clearly in the clinical picture; with duodenal ulcer mental anxiety and excessive smoking, especially of cigarettes, appear to be the most common causes of origin and relapse, with overwork, hunger, and cold closely associated. The majority of duodenal ulcers react remarkably well to medical treatment and the abandonment of smoking, and patients may remain for years at a time in perfect health; relapses are usually due to some definite cause, and the symptoms again disappear under treatment in the most satisfactory manner; there is no great tendency for the disease to become refractory. Gastric ulcer reacts equally well to medical treatment in the early stages, but greater care is necessary to prevent a recurrence.

Duodenal ulcer offers the better prognosis with regard to prospect of cure, or of intervals of health, but is more fatal, the deaths being due to hæmorrhage or perforation. Gastric ulcers rarely cause death except as the result of operation; perforation and bad hæmorrhage are exceedingly rare. But unless they are given far more prolonged and strict medical treatment than they generally receive, they lapse into a state of chronic invalidism and increasing pain that makes operation imperative.

The Basis of Ulcer Treatment

Since the two types of ulcer differ so widely in all their characters, while the aims of medical and surgical treatment are fundamentally akin, no comprehensive outlook, which applies the same criterion to both ulcers, or extols one method of treatment to the exclusion of another, is possible to the reasonable and thinking man. The basic principles of ulcer treatment are simple; they are briefly the elimination of sepsis, trauma, and stasis, the combating of acidity and the removal of the ulcer. Attention to decayed teeth and other infective foci, provision of proper dentures, and education in diet and mastication are measures common to physician and surgeon, for if sepsis persists and food is still bolted insufficiently chewed, no medical cure is permanent and no surgical cure is safe. The methods used to overcome stasis and control acidity differ in each case, and the physician removes the ulcer by the natural process of repair, the surgeon by excision. The patient only asks to be made well and to be kept well, and he would prefer these objects to be attained, if possible, with the minimum of risk and discomfort. These last demands give medical treatment priority, and relegate surgery to the treatment of those cases where medicine has failed, or where for any reason it may fail or lead to grave dangers. Before deciding upon operation in any case the surgeon must therefore ask himself: "How necessary is operation, how safe is it, and how satisfactory?" In these questions are inherent the subsidiary ones "What are the prospects of cure by means other than operation, and do such non-surgical methods of cure involve the risk of dangerous sequelæ?"

In the case of duodenal ulcer the answer is that operation is safe, as safe as any major abdominal operation can be. At the present time it is entirely satisfactory in about 75 per cent. of cases, but in the remaining 25 per cent. the results vary from unsatisfactory to dreadful. It is not necessary, except when stenosis has supervened or there have been one or more severe hæmorrhages. Medical treatment will cure the great majority—in early ulcers with no visible scar, in later cases with a cicatrix that will probably remain healed with reasonable care, and will heal again if it does become active. A healed duodenal ulcer never becomes cancerous; hæmorrhage, perforation, and stenosis may all occur, but only if the ulcer becomes active again, and usually after sufficient warning. The treatment of duodenal ulcer is therefore medical, and operation is only required for stenosis, major hæmorrhage, or, in some instances, persistence in spite of adequate medical treatment.

In the case of gastric ulcer the answer again is that medical treatment can heal an ulcer of the stomach. In a small ulcer treated thoroughly within six months after the appearance of symptoms this healing is rapid and likely to be permanent and to allow the resumption of a normal mode of life. If medical treatment is delayed and then only prosecuted half-heartedly and for insufficient periods, the ulcer will heal incompletely or will leave a scar adherent to the liver or pancreas, and will become active again as soon as any laxity in diet is allowed. Recurring periods of activity becoming longer and more severe are to be expected; cancer may supervene in 6 to 10 per cent. of the cases. On the other hand, operation is safe only in the cases which can be cured by medical means. If it be reserved for the failures of medical treatment, as I think it should be, it carries a mortality of 6 to 8 per cent. The average results of operation are at the present time not quite so good as in duodenal ulcer, but on the other hand, the complete failures which are the blot on duodenal surgery are not seen, and the great majority are relieved.

The Operations for Ulcer

The operations which have been devised for ulcer are legion. The rational operations are numerous enough, but they may be divided into three main categories: local excisions of ulcer with varying amounts of healthy tissue, leaving the arrangement of the parts as before; short-circuiting operations; and gastrectomies of various types.

It is very doubtful if the operations of local excision deserve any serious support. They remove the ulcer, but leave in its place a scar which, while it is tidier than that of a healed ulcer, is also longer. They do nothing to counteract the cause of ulceration, and by producing a deformity at the site of excision proportionate to the amount of tissue removed and that taken up by the infolding sutures, they add the factor of mechanical trauma to those already present. Local excision appears to find considerable favour with American surgeons, but in my hands, and I think the majority of British workers, it has failed to give more than temporary relief. I would like to suggest, in passing, that the conclusions of American surgeons have very little bearing upon the ulcer problem in this country. They appear to be perfectly

satisfied with various limited operations which we find quite valueless, and the explanation lies, I am sure, in the fact, which has been repeatedly pointed out by their surgical writers, that the type of ulcer encountered in Europe differs from that prevalent in America.

Of the short-circuiting operations it is necessary to speak a little more fully. Under this heading are included gastrojejunostomy of various types, gastroduodenostomy, several plastic operations in the pyloric region which are usually combined with excision of a duodenal ulcer, and limited resections of the pyloric antrum and duodenal bulb. All these operations seek, by making an anastomosis between the stomach and small intestine, to overcome stasis and counteract acidity. They do not claim to diminish the secretion of acid, but to ensure its neutralisation by allowing the free entry of alkaline juices into the stomach.

I propose to take posterior gastrojejunostomy as the representative of this group, because in my opinion, and apparently in that of the great majority of surgeons, it is the best. It is best because it is safe and mechanically satisfactory. The resulting stoma is large, free from tension and adhesion to neighbouring structures, and able to move with the contractions of its component parts and of neighbouring organs. It has been so perfected in all its stages that it is now a standard operation, performed in an almost identical manner by surgeons in all parts of the world. In practised hands it is supremely easy, and is capable of giving brilliant results.

The various gastroduodenal anastomoses are supported by the claim, to my mind a false one, that they are more physiological than gastrojejunostomy. It is pointed out by their supporters that the new opening is at or near the site of the pylorus, and that the chyme passes from the stomach into a part of the intestine that is used to an acid medium. The first argument ignores the fact that the pylorus is a sphincter acting under reflex control, and that no artificial opening, wherever placed, can assume its function. The second is an unsupported statement, and the rapidity with which food, after leaving the stomach, passes through the duodenum and first few coils of jejunum, makes it extremely improbable that the reaction can differ in the two situations. If these juxtapyloric operations are no better than gastrojejunostomy on physiological grounds, they are vastly inferior technically. Owing to local difficulties, which I need not enumerate, the stoma is clumsy, fixed, and under tension; hæmorrhage and soiling mar their performance, and leakage is not unknown afterwards. Their late results, as might be expected, are on the average inferior to those of the older and simpler form of anastomosis.

Gastrectomy, in so far as it is employed in the treatment of ulcer, serves four purposes. Firstly, it removes the ulcer itself when it is in the stomach or the first part of the duodenum. Secondly, since it implies an anastomosis between the remaining part of the stomach and some part of the intestine, it overcomes any stasis that may be present. Thirdly, it allows neutralisation of the gastric by the intestinal juices. And fourthly, it reduces acid production in proportion to the amount of acid-secreting surface that is removed. It must be remembered that the pyloric antrum plays little part in acid secretion, the oxyntic cells being masses in the fundus and body of the stomach. The essentials of an efficient gastrectomy are therefore adequate removal of the proximal part of the stomach, and an effective stoma, one that is supple and free from obstruction. Beside these essentials, the shape of the remaining stomach and the site of its junction with the intestine are unimportant. It is necessary to emphasise these points, because the same specious arguments which have been advanced in favour of short-circuiting operations at the pylorus are used to support gastrectomy with gastroduodenal anastomosis. The anatomist still rides on the surgeon's back. I would condemn this group of operations, Billroth I. and its many modifications, not only for the unnecessary dangers and difficulties they introduce, but because the reduction of acid surface is often inadequate, or if adequate leads to tension in a stoma which is always small and fixed.

The Place of Gastrojejunostomy

In discussing the place of surgery in the treatment of peptic ulcer, our chief concern must be to examine the place of gastrojejunostomy in ulcer surgery, for this operation remains the supreme favourite of the older generation of surgeons in England and America. The claims for gastrojejunostomy are twofold—that it overcomes stasis and that it allows neutralisation of the acid gastric contents. These two claims must be considered separately. A fresh opening, if correctly placed and efficiently fashioned, will most assuredly empty the stomach and relieve stasis if this is present. But such an opening will not necessarily reduce the acidity of the gastric contents, and in fact it does not do so. High acid and rapid emptying go together, and when an artificial opening has been made, the emptying of the stomach is still more rapid and neutralisation less complete. The claims for the neutralising action of gastrojejunostomy were based upon test-meals performed shortly after the operation; but later investigations of the same patients have shown that the acid curve has returned to its pre-operative level, or even higher. The low value obtained at the first test-meal was due, not to neutralisation, but to the effect of the operation itself upon gastric secretion.

When gastrojejunostomy is performed for pyloric stenosis, the indication for which it was originally planned, it will give results second to none in surgery. Stasis is overcome, and the patient, emaciated and miserable, gains weight and strength from day to day. In pyloric stenosis the stasis with its resulting gastritis has led to atrophy of the gastric mucosa with a permanent reduction in acidity, and lasting freedom from trouble may be anticipated. But because of its success in old duodenal ulcers with cicatricial contractions gastrojejunostomy has been adopted in many quarters as the standard operation for every duodenal ulcer, and it is here that I would put in an urgent plea for its abandonment. In an ulcer without stenosis an anastomosis, by deviating acid from the ulcer site, will produce healing in the majority of cases, but it does nothing whatever to counteract the causes which produce that ulcer; rather by increasing the rapidity of emptying and consequent deficient neutralisation, it renders fresh ulcers in new situations even more probable.

Jejunal ulceration is the bugbear of gastrojejunostomy when carried out in the presence of high acid, and I am certain that the frequency of this complication is far higher than many surgeons will admit. It was formerly believed that anastomotic ulcers were due to some error in technique, and that a gastroenterostomy which had remained satisfactory for two years would continue to do so. I believe that both these statements are wrong; that the ulceration at the stoma is due, not to an error in the manner of its performance, but to the basic error of

performing it at all in the presence of a high acid; and that such ulcers become not less but more frequent as the interval from the time of operation increases. In the figures collected by the Association of Surgeons the interval between operation and the first symptoms of jejunal ulceration exceeded three years in about 25 per cent. of the cases traced, and it must be remembered that a number of late ulcers, increasing each year, will have been lost to sight. In my own series the shortest interval was 2 years and the longest 30 years, the average being 9·6. This lapse of time explains why the average surgeon is quite unaware of the number of jejunal ulcers of which he is guilty; the case which is perfectly well after three years is apt to be classed as permanently cured.

The true incidence is difficult to estimate. The majority of surgical writers confess to an incidence of about 2 per cent. But I must repeat that what the surgeon says about his own work is not evidence. Two fallacies are evident in all such personal series. One is the matter of untraced cases, for no man can trace all of them. "You can trace all the cases some of the time, and some of the cases all the time." But in any hospital district a certain proportion of patients will have flitted several times by the end of the first year, leaving no address. By the end of the third year, when the jejunal ulcers are starting to appear, so many will be missing as to render any statistics of doubtful value. The successes and a few persistent grumblers will present themselves regularly, but all the dead and the disillusioned are among the missing. The second fallacy concerns the interpretation of results. An optimist can interpret anything as a success, and I suspect that under the heading of "improved, but not symptom-free" will be found many cases of recurrent ulceration. This class numbers, on the average, 25 per cent. In my experience and that of my medical friends no unsatisfactory gastrojejunostomy ever becomes satisfactory again; if traced long enough they will all be found to develop anastomotic ulcers.

In our search for truth we may apply three checks. One is to set the pessimists against the optimists. Lewisohn in a series of 68 cases re-examined four to nine years after gastrojejunostomy for duodenal ulcer, found anastomotic ulceration in 34 per cent. Friedman, in a similar investigation, gives the figure of 25 per cent. A series of post-mortem operations at Leeds on patients who had undergone gastrojejunostomy for duodenal ulcer at periods varying from nine months to nineteen years before death, showed anastomotic ulcers in 22 out of 30, an incidence of 73 per cent. Another check is that of personal experience. I have operated 82 times for ulcer in the last two years; out of these, 17, or 21 per cent., have been for gastrojejunal or gastrojejunocolic ulcers. Among these 17 cases the original operation had been done in one by myself, in four by colleagues at my hospital, in eight at other London or provincial hospitals, two in Africa, one in America, and one in Asia—sufficient evidence that the jejunal ulcer patient places the greatest possible distance between himself and his first surgeon. Among my medical acquaintances are 17 men with duodenal ulcer. Nine of these have persisted with medical treatment, and are, to outward appearances, perfectly well; all nine are surgeons. Eight have had a gastrojejunostomy performed; of these three are well, one died after an operation for anastomotic ulcer, one was operated on successfully for gastrojejunocolic fistula, and the remaining three are living in a state of great misery. Only one of these eight—I am glad to say, one of the successful three—is a surgeon. A third check is that of mass statistics. The collective investigation of the British Medical Association published in 1929 will immediately come to mind. Here we have considerable internal evidence, in the quite abnormal death-rate for simple operations, in a mortality for gastrojejunostomy alone three times as high as that for gastrojejunostomy with excision of ulcer, and in the enormous returns for that hypothetical lesion the pyloric ulcer, that much of the surgery included was of a low order. We should therefore expect a high incidence of jejunal ulceration, yet it is only 2·8 per cent. We find however that only 78 per cent. of the cases were traced. Another valuable document is the collective inquiry by the fellows of the Association of Surgeons which has been summarised by Garnett Wright. Here we find 8·75 per cent. jejunal ulcers following gastrojejunostomy for duodenal ulcer. This figure represents the work of good surgeons, presented anonymously and analysed impartially. It must therefore be looked upon as the lowest that can be expected under the best conditions. There are several reasons why it is too low; one that recurrent ulcers are less frequent after posterior gastrojejunostomy with entero-anastomosis than after the simple short circuit, another that the untraced cases of which a high proportion are failures are 35 per cent. of the total.

I suggest therefore that ulceration at or near the stoma will eventually follow gastrojejunostomy when performed for duodenal ulcer in at least 20 per cent. of cases. The patient with a gastrojejunostomy may be happy, but he is never safe. Such an ulcer is one of the most distressing problems we can meet. Operation is required eventually, and such an operation is always severe, and may be one of the most difficult in surgery. It has an average mortality of 19 per cent.

The Place of Gastrectomy

I think then that our attitude towards duodenal ulcer should be this. We should look upon it as essentially a medical disease, which will react to treatment in a satisfactory manner in all but a small percentage of cases. If stenosis supervenes we have in gastrojejunostomy a simple, safe, and satisfactory remedy. There remain a very small group, the cases that continue to have symptoms in spite of strict medical treatment conscientiously followed, and those that have had one or more severe hæmorrhages—that is, the loss of one or more pints of blood within a few minutes. In my experience these large single hæmorrhages are always associated with posterior ulcers, eroding the head of the pancreas, and the artery involved is usually the gastroduodenal. Satisfactory healing of a breach in an artery of this size can never be relied upon, and it is in fact notorious that patients who have one such major hæmorrhage from a duodenal ulcer are very liable to have another and often a fatal hæmorrhage.

In both of these groups the acid is usually high and the emptying rapid, and gastrojejunostomy is therefore, in my opinion, absolutely contra-indicated. There is only one method by which the secretion of acid can be permanently reduced below the level at which ulcers can occur, that is by a really high gastrectomy, removing at least three-quarters of the stomach.

Gastric ulcer we must also look upon as a medical disease to be treated medically, and amenable to cure if such treatment is started early and conscientiously carried out. If, however, the ulcer has first appeared after the age of forty, if it is larger than ¾ inch in diameter, if it has failed entirely to respond

to three months of strict medical treatment, or if because of absent hydrochloric acid or persistence of occult blood in all specimens malignancy is suspected, operation must be undertaken. In the case of gastric ulcer I am certain that gastrectomy is the only operation that gives a reasonable proportion of good results.

I have therefore answered my first question—is operation necessary in the treatment of ulcer?—by formulating certain groups in which surgery offers the patient the only prospect of lasting relief, and by bringing forward reasons which I hope have convinced you, for my belief that posterior gastrojejunostomy for pyloric stenosis and high gastrectomy for resistant or bleeding duodenal ulcers and for all gastric ulcers requiring surgery, are the only operations which stand upon a secure basis. A gastrectomy for ulcer must be high, for anything less is false conservation; recurrent ulceration is almost as frequent after the timid gastrectomy as it is after gastrojejunostomy and the results of such operations are unsatisfactory in the highest degree.

This standpoint has been accepted for many years by nearly every surgeon of importance on the continent, and is that of the majority of the younger surgeons in Britain and the United States who are experienced in ulcer work and familiar with the evil results of the older operations. It is distasteful to the more senior group in each of these countries, on the grounds that gastrectomy is unnecessarily mutilating and radical. Is not this false reasoning? Gastrojejunostomy is functional gastrectomy; the pylorus is thrown out of action and the stomach beyond the stoma receives no food; this sequestered distal portion has no function beyond that of secreting acid which is in excess of requirements and of safety. For the words "conservative" and "radical" as applied to gastrojejunostomy and gastrectomy we should substitute "insufficient" and "thorough."

The scope of the last two questions—is operation safe and is it satisfactory?—has now been narrowed down considerably, and the answers can be given briefly. We are concerned only with the safety and success of high physiological gastrectomy.

The mortality of gastrojejunostomy in practised hands is about 1 per cent., while on the other hand Schwarz and Gioja give the preposterous figures of 17·5 per cent. and 22·8 per cent. respectively. Reference to a number of different sources suggests that 5 per cent. is a fair average. If 18 per cent. of the survivors develop jejunal ulceration, which carries an operative mortality of 22 per cent., the total death-rate will work out at about 9 per cent. The mortality for gastrectomy is more difficult to estimate, for in many series operations for cancer, gastric ulcer, and duodenal ulcer are considered together. The problem is different in each. In cancer the operation is often one of considerable difficulty and the patient usually old and cachectic; in gastric ulcer the general risks are less but the local difficulties may still be considerable; in duodenal ulcer, however, the operative field is concerned with healthy tissues only. A fair estimate of the mortality of gastrectomy for the three conditions would be: for cancer 10 per cent. to 30 per cent., according to the skill of the surgeon and the proportion of advanced cases he is prepared to tackle; for gastric ulcer 6 to 8 per cent.; and for duodenal ulcer 5 per cent. But if the operation is necessary it must be made safe, and I am perfectly certain that the surgeon who can produce a mortality of 1 per cent. in gastrojejunostomy can show a slow a figure for physiological gastrectomy.

In my opinion three things are necessary to give this procedure the safety we must insist upon in any operation for a non-malignant condition: local anæsthesia, technical simplification, and team-work. I have done my last 100 gastrectomies under local anæsthesia alone, and in my hands this has proved the greatest factor in reducing mortality. The method takes time but it eliminates any need for hurry; it has entirely abolished shock and hæmorrhage, so that cases leave the table with a good pulse, needing no infusions, and able to take any fluids they require by mouth. Patients may die, but the operative and immediate post-operative deaths have disappeared. Matters of technical simplification concern the surgeon himself, but I would emphasise one point, that it is unnecessary in a physiological gastrectomy to divide the duodenum. Duodenal occlusion is a neater job and should therefore be preferred if it can be done with no risk at all; but if the ulcer site is surrounded by adhesions, if the ulcer itself is low and posterior, or if the duodenal wall is widely scarred, the line of distal division should be proximal to the pylorus. No acid is secreted by the pyloric stump and the duodenal ulcer will heal and remain healed. Team-work is essential to all good surgery. Physiological gastrectomy becomes with practice a matter of successive steps which are done in the same sequence and an identical manner in every case. Only with an assistant who knows his part in every manœuvre and a sister who has each instrument and suture ready before it is required can it be done perfectly and safely in patient after patient. My own series numbers 82 cases only, too few to draw any conclusions, but one consequence of the views I have expressed is that the ulcers in which I consider operation advisable are only a small proportion of those I see; especially is this the case with duodenal ulcer. The mortality has been:—

	Total.	Deaths.	Percentage.
All ulcers	82 ..	5 ..	6
Primary ulcers together ..	65 ..	3 ..	4·5
Gastrojejunal and gastro-jejunocolic..	17 ..	2 ..	12
Gastric ulcers	50 ..	3 ..	6
Duodenal ulcers	15 ..	0 ..	0

Of the functional success of gastrectomy, abundant reports are now available. A man with one-fifth of a stomach is probably not as good as a man with a complete normal one; but he is in florid health, can eat every kind and quantity of food, and is in all ways better than one with an ulcer. The unsatisfactory results are due to three causes—anæmia, recurrent ulceration, and distension of the closed duodenal loop. Anæmia was first reported as a sequel of total gastrectomy, but cases following high subtotal excision have since been recorded. Later experience shows that this complication is uncommon even after total, and distinctly rare after partial gastrectomy; I have not encountered it in any patient in my series. In any case it yields readily to a course of iron taken by mouth. Recurrent ulceration only occurs when the removal of acid-bearing surface has been insufficient. I have seen two such recurrences after gastrectomy of the Billroth II. type, a thoroughly unsatisfactory operation. I have never seen it after a high gastrectomy, and fractional test-meals three or four years afterwards show that the acid secretion remains at a level below that at which ulceration can occur. Distension of the proximal loop gives rise to a feeling of fullness and discomfort after meals caused by food entering the afferent limb of the anastomosis. The proximal part of the duodenum can sometimes be

felt in such cases as a rounded tumour, and a barium meal will show that part of the food enters the loop and is only evacuated after some hours. This trouble, which is far from common, is avoided entirely by the Finsterer valvular gastrectomy, which I now use exclusively.

Of my own results I cannot speak without drawing on my head the criticisms I have levelled at others, but they confirm my faith abundantly. If I ever felt inclined to hesitate, I think of an old agricultural labourer in Bedfordshire, on whom I performed a high gastrectomy in 1927 at the age of 78. This old gentleman has been robbed by the years of all the safeguards which protect the normal stomach—teeth, discretion, and a wife. Yet he eats freely of everything that his means can buy and his skill can cook, and to-day at the age of 85 he is doing full work on the farm.

RENAL SYMPATHECTOMY AND RENAL SYMPATHETICO-TONUS

THE SCOPE AND LIMITATIONS OF THE OPERATION

By S. Harry Harris, M.D., Ch.M. Sydney, F.R.A.C.S.

HONORARY UROLOGIST, LEWISHAM HOSPITAL, SYDNEY

At the present juncture, when the operation of renal sympathectomy has been so enthusiastically acclaimed in some quarters and perhaps even more roundly condemned in others, it seems appropriate that one who, under the most rigid selection, has practised the operation for the past eight years should issue an emphatic word of warning against its promiscuous application.

In the urological department of the Lewisham Hospital renal sympathectomy has been very strictly limited in its field of application and has in no case been employed in conjunction with nephropexy or decapsulation, as practised and recorded by Papin and Ambard.[1] It has been carried out since October, 1926, solely for the relief of the pain of increased intrarenal tension, in cases of urinary stasis arising from neuromuscular dysfunction of the renal pelvis, calices, and upper portion of the ureter—a definite type of obstructive nephropathy to which five years ago the author affixed the title of "renal sympathetico-tonus." Renal sympathectomy may be employed in cases of this type with a certainty of success which is exceeded by few other operations. While there is no scientific basis for the application of the operation in other types of renal pain or renal pathological conditions, there is ample evidence to prove that its indiscriminate use merits nothing but condemnation. The general recognition of these facts would lead to a far more judicious selection of cases for operation, and to the exclusion of those totally unsuitable.

At the symposium on the surgery of the sympathetic nervous system at the British Medical Association annual meeting in Winnipeg in 1931, in conjunction with Dr. R. G. S. Harris, my associate in the urological department of the Lewisham Hospital, I presented a paper detailing our experiences with renal sympathectomy and its indications, which was published in the *British Journal of Urology* [2] and the *Canadian Medical Association Journal*.[3]

Later experience has fully confirmed the original findings, but has not appreciably widened the scope of the operation. With the possible exception of 3 who could not be traced, all the patients originally submitted to the operation, numbering 28, have remained well, and up to the end of July, 1934, 42 new patients have been submitted to the operation, making a total of 70 in all. There has been no operative mortality.

THE EFFECT OF RENAL SYMPATHECTOMY ON THE NORMAL KIDNEY

In the laboratory animal the effect of denervation of the renal pedicle, or renal sympathectomy, has been the subject of much research. It is an established fact that, apart from a transitory polyuria of the affected kidney, the operation per se has no effect whatever, immediate or delayed, on the secretory or functional capacity of the kidney.

NOMENCLATURE

The condition of neuromuscular dysfunction resulting in stasis or delayed emptying of the reno-pelvic excretory apparatus was, for convenience, tabulated in the urological department of the Lewisham Hospital as "renal sympathetico-tonus," my nomenclature being adopted. Dr. W. A. Osborne, professor of physiology in the University of Melbourne, who has been interested in this work from a purely physiological point of view, has suggested the name of "renal asthma," as possibly being more expressive. My own preference is not to depart from my original title which, though less euphonious, is probably more aptly descriptive of the condition than any other designation hitherto suggested.

SOME ANATOMICAL AND RADIOLOGICAL CONSIDERATIONS

During the last eight years a considerable amount of work has been done on this subject in both the urological and radiological departments of the Lewisham Hospital. Pyeloscopy by means of the fluroscopic screen which, in a manner similar to gastric fluroscopy, permits observation of the peristaltic movements of the calices, pelvis, and ureter, is now carried out as a routine in patients subjected to pyelography. It is perhaps insufficiently recognised that the pelvis and calices constitute in effect a hollow muscular viscus, the rhythmical movements of which are, as in other hollow viscera, subject to nervous influence. The normal sequence is for the calices to contract in regular order from above downwards, followed by contraction of the renal pelvis; the renal pelvis institutes a peristaltic wave in the ureter, which in turn is propagated into the bladder. The terms "systole" and "diastole" have been borrowed to designate the alternate periods of contraction and relaxation which characterise the movements of the renal pelvis. The visualisation of these movements by pyeloscopy originally made possible the recognition of the different stages of renal sympathetico-tonus. More recently serial radiography has afforded a most striking method of permanent record. However, a diagnosis sufficient for routine purposes may in most cases be made by pyelography alone, provided that a radiological estimate be made at the same sitting of the emptying time of the renal pelvis.

After pyelography has been carried out, the normal rate of emptying of the renal pelvis, when a watery opaque medium has been employed, may, as Legueu [4] has pointed out, be regarded as approximately one cubic centimetre per minute. So that if ten cubic centimetres have been injected, ten minutes after removal of the catheter, there should be little or no evidence of any opaque medium in the radiogram. Any outlining of the pelvis or calices at this time

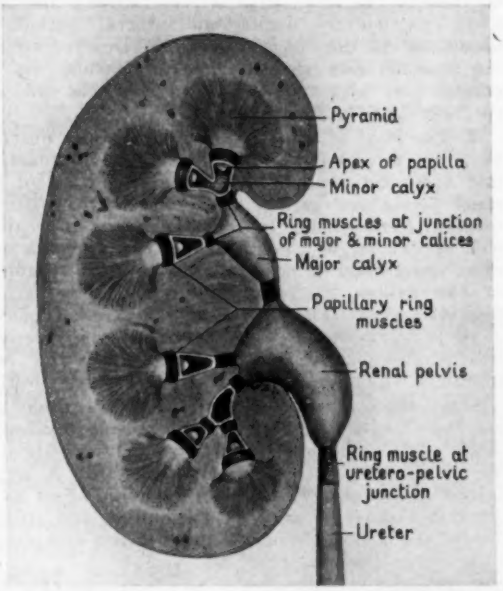

FIG. 1.—Diagrammatic representation of the ring-muscle system of the renal pelvis and calices described by Kelly and Burnam. The anterior wall of each minor calyx is here shown cut away to expose the enclosed papilla. It will be seen that a ring-muscle surrounds the base of each papilla, the junction of each minor and major calyx and the uretero-pelvic junction. The ring-muscle in the latter position is the strongest of the group. The ring-muscles are shown much enlarged for purposes of illustration. (Elaborated from the original in Kelly and Burnam, "Diseases of Kidneys, Ureters and Bladder.")

may be regarded as evidence of retention. The denser the shadow, of course, the greater the stasis or delay in emptying time.

The muscular system of the renal pelvis and calices includes, in addition to the longitudinal and circular muscle-fibres appertaining to them as components of a hollow viscus, the ring-muscle system described by Kelly and Burnam [5] (Fig. 1). The later work of Muschat [6] provides confirmation of the original findings of these authors so far as the papillary ring-muscles are concerned. The evidence afforded by pyeloscopy, if not completely confirmatory, is at least extremely suggestive of the accuracy of the description by these authors of the ring-muscle system of the calices and pelvis.

ÆTIOLOGY OF RENAL SYMPATHETICO-TONUS

Of the ætiological factors concerned, little or nothing definite is known. The disease rarely attacks people in robust health. Worry and overwork have been outstanding features in nearly all cases. The attacks of pain are believed to be brought about by increased excitability of the sympathetic nerve-supply to the kidney (possibly due to vaso-constriction of the spinal cord; Royle), though this sympathetic over-activity, while commonly unilateral, may often be shown to be much more comprehensive in its distribution. Evidence of this is to be found in muscular hypertonus, illustrated in this series of investigations by increased excitability of the knee-jerk on the affected as compared with the normal side, with delayed relaxation time and absence of the normal oscillations. Hypertonus, as estimated by the knee-jerk, is liable to variation from time to time in the same patient and is subject at the time of examination to the phenomenon of "fatigue." The latter is quite an important consideration. For this reason attention should be focused on the first tests made, and the patient should be properly prepared—e.g., by removal of boots, &c.

It is reasonable to suppose that this periodical variation of hypertonicity applies also to the kidney, affecting the entire musculature. The intermittent nature of the pain would thus find a ready explanation. The renal stasis as exemplified by the delayed emptying time of the renal pelvis after pyelography is, however, a constant finding.

STAGES OF RENAL SYMPATHETICO-TONUS

The disease tends to fall naturally into three stages, and although there is no hard-and-fast line of demarcation between them the differentiation is of more than academic interest.

1. *The stage of irritability or over-exertion.*—In this first stage of renal sympathetico-tonus the condition of systole or contraction of the renal pelvis and calices predominates. This is well demonstrated in serial intravenous urography—that is, when a number of consecutive pictures are taken side by side on the same film. The greater majority of the films, especially during a painful period, will demonstrate a state of contraction of the involved pelvis, which

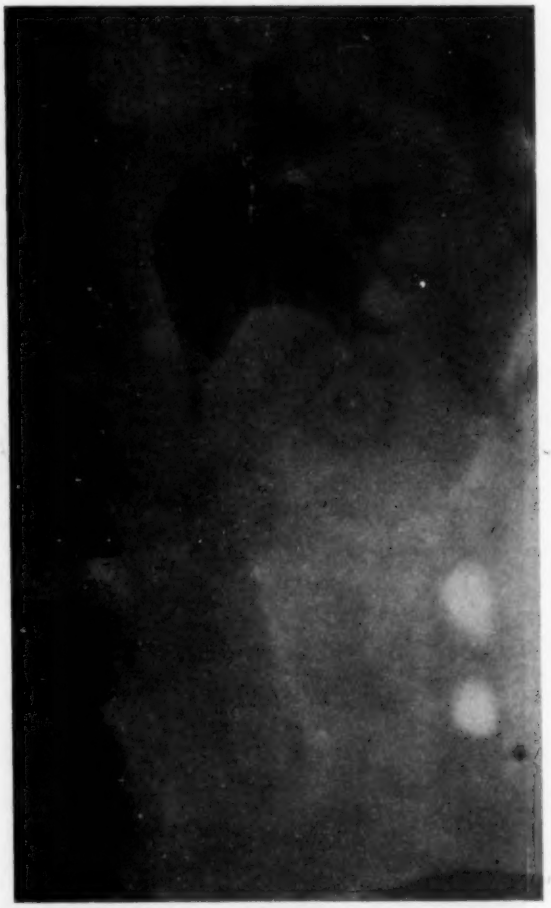

FIG. 2.—Intravenous urogram (three-quarters actual width), illustrating Stage 2 of renal sympathetico-tonus before renal sympathectomy—pelvis dilated and atonic with perhaps slight clubbing of the calices. Serial radiography at this time showed the renal pelvis to be in a condition of more or less persistent diastole.

will be rendered especially noticeable by a comparison with its fellow of the opposite side. In the interval between attacks little or no deviation from the normal may be found.

This stage is characterised by frequent, irregular, and inefficient contractions of the calices and pelvis, many of which are not transmitted. There is little or no deformity of the pelvis or calices. The emptying time, estimated by pyelography, is considerably delayed. The pain, as a rule, is intermittent and colicky, and generally, though not necessarily, moderately severe. Hæmaturia may be an outstanding and rarely the only feature. I have had four examples of this.

Pyeloscopy, if undertaken during a painful period, will typically reveal an extremely irritable pelvis, the contractions of which by their irregularity and inefficiency are very reminiscent of those of auricular fibrillation. A hypodermic injection of eserine (gr. 1/100) will induce regular powerful contractions with rapid and painless emptying of the pelvis. This is a diagnostic sign of considerable value, since in cases of organic obstruction the increased intrapelvic tension brought about by eserine will either accentuate or possibly induce the pain if it is not present at the time.

The irritability of the pelvis, which characterises this stage of the disease, probably varies from time to time in the same patient (vide supra), and may even, particularly during an interval period, be absent at the time of examination. Delayed emptying time is, however, a constant feature, and in conjunction with the other symptoms is sufficient to determine the diagnosis.

FIG. 3.—Intravenous urogram (three-quarters actual width). Same case as Fig. 2, after renal sympathectomy. The diminution, illustrated here, in the size of the renal pelvis was fully confirmed by the serial radiograms.

2. *The stage of exhaustion.*—Here definite obstruction has developed at the uretero-pelvic junction, and the condition of diastole or relaxation of the renal pelvis and calices predominates, even during interval examination, so that the pelvis and calices will appear larger than those of the opposite side even when little or no actual dilatation or clubbing of the calices has occurred. The flabby, atonic diastolic pelvis (Fig. 2) presents a striking picture in serial intravenous urography. Pyeloscopy demonstrates irregularity and inefficiency of the contractions, which are generally infrequent and powerful.

This stage is characterised by more prolonged periods of dull pain with periodical acute exacerbations. The emptying of the renal pelvis, estimated by pyelography, is completely held up. A hypodermic injection of eserine has the same effect as in Stage 1. Any clubbing of the calices and dilatation of the pelvis disappears more or less completely after sympathectomy (Fig. 3).

3. *The stage of dilatation or paralysis.*—In this, the third stage, any grade of hydronephrosis may be present. This is the stage of retention with overflow. It is associated with relative immobility of the pelvis and calices, and is characterised by infrequent attacks of renal pain generally of great severity. The pain is relieved by a hypodermic injection of eserine unless organic obstruction is also present.

SOME SPECIAL FEATURES

A valuable test which may be carried out on the operating table, either before or after sympathectomy, is the reaction to a hypodermic injection of eserine, which will induce regular and powerful contractions unless organic obstruction is present at the uretero-pelvic junction. The presence of organic obstruction, which may be of the nature of valve formation or of congenital or acquired stricture, will prevent normal contraction, and will, of course, be a very definite indication for exploration of the uretero-pelvic junction. Should the pelvis be found in a flaccid—i.e., more or less empty—condition at the time of operation, its partial filling with a fine needle before the hypodermic injection of eserine will amplify the reaction and thus render more pronounced the result of the test. Per contra, when plastic repair of hydronephrosis has been undertaken and no organic cause of obstruction has been discoverable, the operation should be completed by carrying out a renal sympathectomy. Some of the disappointments which occur after the apparently successful repair of hydronephrosis will thus be avoided.

Distension of the renal pelvis in renal sympathetico-tonus is never so "tight" as that sometimes found in organic obstruction and, as stated above, will react to eserine unless it is complicated by organic obstruction.

All stages are characterised by tenderness in the costovertebral angle, at any rate during a painful period, by a positive result to a pain-reproduction test on cystoscopic examination, generally by normal urinary findings, and, except in the third stage, by little or no interference with the renal function. All stages are liable to be complicated by attacks of so-called "pyelitis," due to infection of the residual

urine. This sometimes, especially in the third stage, leads to organic deformity of the uretero-pelvic junction and upper part of the ureter due to adhesions. The pre-existing stasis is thereby aggravated.

In all the patients who have come under observation the renal pain has, without exception, been unilateral and, in the absence of infection, localised to the renal area and without any concomitant bladder disturbances. In two patients the disease later manifested itself in the opposite kidney, demanding sympathectomy.

After renal sympathectomy in Stages 1 and 2 the renal pelvis and calices resume approximately their normal function and little evidence can be found of any previously existing dilatation or stasis (Figs. 2 and 3). In Stage 3, however, even after a successful sympathectomy, the pelvis and calices remain permanently dilated. The emptying time, though markedly improved, in advanced cases at any rate remains permanently impaired, and there is always some residual urine in the pelvis and calices. This condition may be further relieved in suitable cases by some type of plastic operation on the renal pelvis.

FIG. 4.—Renal sympathectomy, illustrating the author's method of exposure and finger-point control of the vessel of the pedicle.

In certain cases, when constipation is prominently associated with the disease, lumbar ramisection may be advantageously performed through the same incision at the same time as renal sympathectomy. This procedure I have carried out on five occasions without difficulty. It adds only a very few minutes to the time of the operation.

EXPLANATION OF VARIOUS STAGES

It is presumed that the over-action of the sympathetic nervous system on the musculature of the renal pelvis, calices, and ureter (vide Max Brodel's drawing, Fig. 1) impedes their movements and makes them difficult, induces increased intrapelvic and intracalical tension, and causes pain. Renal sympathectomy removes this impediment, with resultant lowering of tension and relief of pain.

In Stage 1 the dysfunction probably affects more or less equally the entire pelvi-calical musculature, comprising the circular fibres of the ring-muscles as well as the visceral musculature of the pelvis and calices. This leads to urinary stasis with increased intrapelvic tension and delayed emptying. The increased effort made by the pelvic musculature counteracts to some degree the complete hold-up which would otherwise ensue, so that the emptying, as stated above, in this stage is merely delayed but not completely held up as in Stages 2 and 3.

The constriction of the base of the papilla by a spastic ring-muscle would afford a ready explanation of the hæmaturia which has been the outstanding symptoms in four cases in this series.

In Stages 2 and 3, as the sphincter at the uretero-pelvic junction becomes more and more spastic and unyielding, the intrapelvic pressure becomes further increased and the ring-muscle system of the calices becomes progressively more incompetent, leading at first to dilatation of the pelvis and clubbing of the calices, and later to hydronephrosis of a pelvic type and of any degree, the condition bearing a close analogy to Hirschsprung's disease of the large bowel or megacolon.

DIAGNOSIS OF RENAL SYMPATHETICO-TONUS

For practical purposes the outstanding diagnostic features of renal sympathetico-tonus may be summarised briefly as follows:—

FIG. 4a.—Shows method of instrumental dissection; anterior surface of vein completely cleaned up; dissection of artery just begun.

1. Renal pain, confined to one side only.
2. Recurrence of pain after its temporary relief by eserine.
3. Urinary stasis involving the pelvis and calices of the affected kidney.
4. Less frequently, a hypertonic knee-jerk on the side of the lesion.
5. The absence of any demonstrable cause of organic obstruction.

In most cases of renal sympathetico-tonus the diagnosis is clear-cut and leaves no room for doubt. Occasionally the absence of organic obstruction at the uretero-pelvic junction will, notwithstanding the most thorough investigation, have to await final verification at the time of operation. In the third stage of renal sympathetico-tonus, when there may have developed a secondary organic obstruction at the uretero-pelvic junction, the primary lesion may very easily be overlooked. Much research still remains to be done.

Pyeloscopy and serial intravenous urography, in addition to instrumental pyelography, have already proved their worth, and it seems probable that methods of cinematographic urography, which are in process of development, will lend further valuable

aid to the elucidation of the problems of this most interesting disease.

TREATMENT OF RENAL SYMPATHETICO-TONUS

In some cases, particularly in the first stage of the disease, the hypodermic injection of eserine (gr. 1/100–1/60) twice daily for two or three weeks will, if combined with and followed up by general remedial measures, suffice to bring about relief. Too often, however, the pain recurs when the eserine is omitted. The eserine may be administered orally for a more prolonged period of time, with occasional success; but given orally, it is neither so potent nor so certain in its action as when given by hypodermic injection. The results obtainable are not such as to warrant prolonged perseverance with medical treatment.

The two outstanding factors upon which the success of renal sympathectomy ultimately depends are the correct selection of cases and the performance of a complete operation. The so-called difficulties and dangers of the operation I have found to be very greatly exaggerated; they are due mainly to the employment of an inadequate technique.

FIG. 5b.—Indicates method of denervation of renal artery.

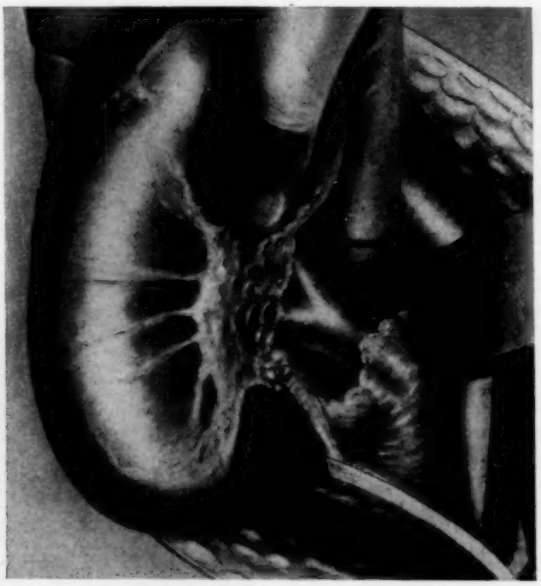

FIG. 5.—Renal sympathectomy, showing completed operation. Renal artery and vein, renal pelvis, uretero-pelvic junction and upper portion of ureter completely cleaned up.

The original technique of Papin,[7] by which the fatty tissues are gradually wiped back in a mesial direction with gauze from the vessels of the renal pedicle, is fraught with grave risk of hæmorrhage from tearing of the renal vein or its branches, and this hæmorrhage may be difficult to control or may even demand nephrectomy. I used this method in my earliest cases, and twice had to carry out nephrectomy to control the bleeding. This technique was soon abandoned and the method described below was substituted.

In the first two stages renal sympathectomy will afford complete relief. In the third stage, especially if infection has supervened and organic obstruction has developed, conjoint operations may be necessary—e.g., freeing of adhesions at the uretero-pelvic junction and upper part of the ureter and repair of hydronephrosis. Operative relief directed towards the organic obstruction alone would be insufficient, as the primary cause, the renal sympathetico-tonus, would still be operative and lead to persistent stasis. Of this I have had convincing clinical and operative proof. This offers a feasible explanation of some of the cases of gradually progressive hydronephrosis consequent on what has been apparently, in the first place, a completely successful plastic operation for the repair of hydronephrosis.

OPERATIVE TECHNIQUE

Adequate exposure and illumination of the field of operation are essential; the operation is otherwise quite impossible. The kidney is exposed extraperitoneally through a boomerang-shaped lumbar incision, and completely delivered from its fascial and fatty coverings. Beginning as far away from the kidney as is reasonably possible, the pedicle is isolated from the surrounding tissues, the operator working continuously outwards towards the kidney. It considerably simplifies the operation when the pedicle can be approached at some distance from the kidney before the vessels begin to branch. When the kidney can be completely delivered this is a comparatively easy matter, but in the presence of a very short pedicle it may be impossible, and the dissection will have to begin closer to the hilum of the kidney and be carried out in the depths of the operative field.

After the pedicle has been isolated the individual vessels are attacked in turn by careful instrumental dissection, a beginning being made on whichever aspect of the pedicle affords the more ready access, and the surgeon always working in the direction of the kidney. Each vessel is completely denuded of connective tissue and all the tissue lying between the vessels is removed. The vessels of the pedicle throughout the dissection are supported and rendered prominent by the fingers of the left hand placed behind them (see Figs. 4 and 5). The pedicle is thus at all times and in all situations under the immediate control of the operator, and any bleeding vessels are easily controlled by increasing the forward thrust of the underlying fingers and picked up at leisure by fine-pointed forceps and tied. Fine silk should be used in this situation in preference to catgut. It can be tied more firmly and is not so liable to slip or be wiped off.

After a complete operation, in addition to a careful denudation of the renal artery or its main branches and of the renal vein, the renal pelvis on both aspects as far as the hilum, the uretero-pelvic junction and the first inch of the ureter will also have been cleaned up, the superior ureteral nerve being divided in the process. Finally the kidney will be attached solely by its denuded vessels and ureter (Fig. 5).

Nothing short of a complete operation will ensure a successful result. This, while demanding meticulous accuracy of technique, presents no outstanding difficulties. The increased safety and operative facility which are attained by keeping the fingers of

the left hand at all times in contact with the reverse side of the pedicle to that on which the operator is working cannot be too strongly emphasised. A tear even of the renal vein may thus be ligatured with striking simplicity. Of this I have had more than one experience.

A hypodermic injection of eserine should be given at the end of the sympathectomy, and will be followed within ten to fifteen seconds by strong peristaltic contractions of the pelvis and ureter. This is a useful indication that all is clear in the pelvi-ureteral excretory apparatus. In cases of organic ureteral obstruction eserine will either have no visible effect or may cause fibrillary contractions of the pelvis. The contractions return to normal only when the obstruction is removed. These phenomena I have actually observed several times on the operating table, and also in the laboratory animal.

SUMMARY AND CONCLUSIONS

(1) A disease syndrome has been described to which I have given the name of "renal sympathetico-tonus." (2) It is an obstructive nephropathy in which the neuromuscular dysfunction causing the faulty drainage is unilateral and due presumably to over-activity of the sympathetic nerve-supply to the kidney. (3) The outstanding features are unilateral renal stasis and renal pain, their recurrence after temporary relief by eserine, and the absence of any demonstrable cause of organic obstruction. (4) Three stages, which are readily demonstrable by pyelographic methods, are described—namely, the stage of over-exertion, the stage of exhaustion, and the stage of paralysis. In the first stage systole predominates, in the second stage diastole; and in the third stage hydronephrosis is present. (5) Immediate and permanent relief of symptoms is afforded by renal sympathectomy in Stages 1 and 2. (6) In Stage 3 the aid of plastic surgery may be necessary to overcome secondary organic obstruction. (7) The best interests of surgery in general and of renal sympathectomy in particular will be conserved by rigidly confining the operation to the type of case described.

REFERENCES

1. Papin, E., and Ambard, L.: Jour. of Urol., 1924, xi., 337.
2. Harris, S. H., and Harris, R. G. S.: Brit. Jour. Urol., 1930, ii., 367.
3. Harris, S. H., and Harris, R. G. S.: Canad. Med. Assoc. Jour., 1931, xxiv., 235.
4. Legueu, F.: La Pyeloscopie, Paris, 1927, p. 49.
5. Kelly, H., and Burnam, C.: Diseases of Kidneys, Ureters and Bladder, London, 1922, vol. i., p. 167.
6. Muschat, M.: Jour. of Urol., 1926, xvi., 351.
7. Papin, E.: Chirurgie du Rein, Paris, 1928.

SINUSITIS IN MENTAL DISORDER

By D. N. Parfitt, M.D. Lond., B.Sc. Wales, D.P.M.

SENIOR ASSISTANT MEDICAL OFFICER, WARWICK COUNTY MENTAL HOSPITAL

Graves [1] has reported an astonishing incidence of nasal sinusitis in psychotics and has obtained such striking results with treatment by washouts and drainage that he recommends the routine investigation by proof-puncture of the sinuses of all cases of mental disorder. Of 1000 of his cases, 818 had 1359 infected sinuses between them. More than half the patients recovered after treatment and many others improved, the clinical diagnosis of recovered cases including almost every possible type of psychosis. Clarke,[2] too, found a considerable incidence of nasal sinusitis in 800 cases, and concluded that this infection predisposed to, and exaggerated, mental symptoms. Gibier-Rambaud,[3] among others, has also reported good results with similar treatment.

If the outstanding importance of sinusitis in mental disorder is admitted, a tremendous increase in operative procedures in mental hospitals must follow. Hunt [4] states that sinusitis should be investigated by iodised oils and X rays as well as by the usual methods, and that the radical extranasal removal of all thick polypoid mucosa is the only permanently effective remedy for this otherwise intractable disease, and Buckley [5] maintains that where septic conditions have been present in the mouth, nose, or throat for long periods, it is almost inevitable that there will be secondary foci in other parts of the digestive tract, the gall-bladder, the appendix, or the colon; and the principle of complete eradication of all possible sources of infection by widespread surgical procedures as recommended by Cotton [6] is thus revived. McCowan,[7] however, found only 3 per cent. of his patients with sinusitis as compared with 80 per cent. at Birmingham. He recommended that overt sinusitis should be treated, for in a proportion of his 3 per cent. definite improvement followed washouts and drainage. This conclusion is supported by Wright [8] who states that nasal infections, particularly those of the accessory sinuses, are only to be regarded as of constitutional importance when they are manifest, that is, when there is a definite infected lesion which can be recognised by routine methods of diagnosis.

AN INVESTIGATION

The routine examination of patients for infection of the ear, nose, and throat has been conducted at the Warwick County Mental Hospital by Mr. D. Macalister since the beginning of 1931, and operative procedures have been carried out when indicated. It is proposed to review the results obtained with female admissions during the period from April, 1931, to October, 1932, and further to report the results of a systematic search for sinus infection made in patients admitted during that period, but who were still unimproved by October, 1933. In order to exclude complicating factors as far as possible, syphilitic, senile, epileptic, and puerperal psychoses were not considered, neither were those suffering from advanced physical diseases—such as cancer, tuberculosis, encephalitis, or Graves's disease—nor those dying quickly before examination or treatment could be undertaken or those transferred early to other institutions. Mental defectives were also omitted.

The 122 female patients remaining comprised the majority of cases of mania, melancholia, schizophrenia, paraphrenia, and confusional insanities. Of these 72 had been discharged by October, 1933, 9 had died, 2 had been transferred unchanged, and 39 remained in hospital. Of this 39, 5 had already had complete sinus examinations.

Since Graves reports that of 354 infected sinuses found at Hollymoor 175 were antral and 132 were sphenoidal sinuses (a total of 307), and since symptoms were found to be more severe if the sphenoidal sinuses were involved, only the antra and sphenoidal sinuses were examined in this investigation of the 34 remaining chronic patients. The full Watson-Williams technique as adopted at Birmingham was carried out.

It has been said that it would be an excellent test of the serum treatment of lobar pneumonia if one could tell which 20 of any 100 cases were going to end fatally and watch the effect of serum on those otherwise hopeless cases. This is impossible, but in psychotic patients a similar measure is more practicable. In this instance, for example, if the Birmingham

results can be matched in Warwickshire, the chronic residuum should show a high incidence of sinus infection; but actually, as will be seen, sinus infection in these chronic patients was conspicuous by its absence, and in no single case did washouts and drainage lead to any improvement by November, 1934. It should be added that courses of intravenous T.A.B. vaccine were given to almost all cases that failed to respond early to other treatment. Autogenous vaccines from sinuses, teeth, stomach, cervix, &c., were freely used, and general treatment by forced fluids, colonic lavage, prolonged baths, ultra-violet light, sunbathing, massage, and open-air verandahs were employed in a routine manner when indicated, the general scheme being very similar to that recommended by Graves.[9]

Results obtained by October, 1933, with ordinary routine ear, nose, and throat examinations during the period under review (April, 1931–October, 1932), are shown in the accompanying Tables.

TABLE I.—*Mania and Melancholia*

	Discharged.	Duration in months.*	Since returned.	Died.	No change.
Ear, nose, and throat clear	32	6	2	4	6
Tonsillectomy	4	8	—	—	4

*Average stay in hospital of group.

Three further cases had complete sinus examinations:—

CASE 1.—Pus in left antrum. Culture of *Staphylococcus albus*. Treated by vaccine and Caldwell-Luc operation. Discharged in six months.

CASE 2.—All washings clear, few colonies of *S. albus* from the left antrum. Tonsillectomy performed. Unchanged after three years.

CASE 3.—All sinuses clear and sterile. Unchanged after three years.

TABLE II.—*Schizophrenia, Paraphrenia, &c.*

	Discharged.	Duration in months.	Since returned.	Died.	No change.
Ear, nose, and throat clear	8	10	1	—	19
Tonsillectomy	7	7	1	—	5

Two further cases were transferred unchanged, one twelve months and the other two years after admission. Both clear. Four more cases had complete sinus examinations.

CASE 4.—All clear and sterile. Discharged in fifteen months.

CASE 5.—Thick pus in right antrum. Plentiful growth of *S. albus*. The same organism was cultured from the left sphenoidal sinus. Treated by drainage and vaccines (and tonsillectomy). No change in three years.

CASE 6.—Abundant pus in right antrum, Caldwell-Luc. No change in three years.

CASE 7.—Pus in both antra. Washouts and drainage. No change in three years.

All the cases in both groups shown in Tables I. and II. apparently followed their natural course irrespective of treatment directed against focal sepsis, although some improvement in the general health was commonly observed.

TABLE III.—*Confusional Cases*

	Discharged.	Duration in months.	Since returned.	Died.	No change.
Ear, nose, and throat clear	13	7	1	4	2
Tonsillectomy	2	8	—	—	—

FURTHER CASES

CASE 8.—Purulent otitis media. Died from other causes.

CASE 9.—Purulent otitis media. Treatment commenced after three months, during which time there was no improvement. Clinical cure seemed to follow treatment of this focus.

COMPLETE SINUS EXAMINATIONS

CASE 10.—Pus in left antrum and growth of *S. albus*. Washouts and drainage. Cure in five months.

CASE 11.—Pus in left antrum and growth of *S. albus*. Few pus cells in right antrum, sterile. Washouts and drainage. Vaccine treatment. Cure in ten months. There was a coincident improvement in a spinal osteo-arthritis and improvement seemed definitely related to the removal of the septic foci.

CASE 12.—Stationary for seven months. Discovery of pus in the left antrum and a culture of streptococci, non-hæmolytic and hæmolytic, led to operation for free drainage and vaccine treatment. Rapid recovery in further three months.

In this confusional group there were at least three cases where clinical improvement occurred rapidly following eradication of a septic focus.

ROUTINE SINUS EXPLORATION OF CHRONIC PATIENTS

Of the 34 patients subjected to routine sinus exploration, in 16 the washouts were all clear and sterile, and in 2 more, where the antra only were entered, clear washings and sterile cultures resulted. In 4 more cases blood was obtained from one, two, or three sinuses, without any evidence of infection. In 3 cases cultures of *Staphylococcus albus* were obtained from an antrum, in 1 case the same organism was cultured from the right antrum and the right sphenoidal sinus, and in 1 case *Micrococcus catarrhalis* was grown from the left sphenoidal sinus. All cultures consisted of a few colonies and were probably contaminants, since no other evidence of infection was found. Mucus was found in 5 sinuses (4 antra and 1 sphenoidal) of four further patients, from one of which *S. albus* was grown. The findings in the remaining 3 were as follows:—

(*a*) Few pus cells and a growth of *S. albus* in left antrum.
(*b*) Blood and a few pus cells in the right sphenoid. Culture sterile.
(*c*) Pus and mucus abundant in both antra. The left was sterile, but *S. albus* and *M. catarrhalis* were grown from the right. Treated by vaccine, washouts, and drainage. As previously stated no improvement was noted in any one of these 34 patients.

The large incidence of sinusitis reported by Graves may possibly be accounted for by the inclusion of thickening of the mucosa and hæmorrhage as types of sinusitis. His statement that "provided drainage is free the disturbances are absent or at a minimum" could hardly be applied to mere thickening and a proportion of blood-stained washouts is to be expected when one considers how small the ostia of sinuses frequently are. In regard to thickening of the mucosa the results of Moll[10] are interesting. He found 73 of 337 successive asthmatics with dark antra of which only 21 were infected, the rest being probably due to thickened mucosa present as an allergic phenomenon. "Toxic absorption, at present much spoken of, will probably be similarly discarded from other realms of medicine within reasonable time." This pronouncement of Collier's[11] when discussing the shrinking importance of this ætiological agent in nervous diseases will probably prove true of psychoses.

CONCLUSION

The treatment of sinusitis, if present, cannot be expected to make any material alteration in the prognosis of manic-depressive or schizophrenic psychoses. In certain cases of confusional insanity such treatment may be of great importance, as in 3 cases out of 26 in this series. Indications for

treatment can be discovered by ordinary routine examination, proof-puncture of all sinuses being unnecessary.

I wish to thank Dr. H. B. Leech for permission to use the case material, Mr. D. A. P. Macalister for his skilful coöperation, and Mr. F. Gardner for laboratory assistance.

REFERENCES

1. Graves, T. C.: Jour. Ment. Sci., 1932, lxxviii., 459.
2. Clarke, T. A.: Ibid., 1932, lxxix., 705.
3. Gibler-Rambaud, G.: Presse méd., 1931, xxxix., 1479.
4. Hunt, J. G.: Canad. Med. Assoc. Jour., 1933, xxviii., 54.
5. Buckley, G. W.: Brit. Med. Jour., 1933, i., 774.
6. Cotton, H. A.: Jour. Ment. Sci., 1923, lxix., 434.
7. McCowan, P. K.: THE LANCET, 1933, ii., 853.
8. Wright, A. J. M.: Brit. Med. Jour., 1934, ii., 158.
9. Graves, T. C.: THE LANCET, 1932, ii., 57 and 115.
10. Moll, H. H.: Brit. Med. Jour., 1934, ii., 299.
11. Collier, J.: THE LANCET, 1934, ii., 855.

THE RELATIVE FOOD VALUES OF GLUCOSE AND SUCROSE (CANE SUGAR)

BY SYDNEY W. COLE, M.A. Camb.

UNIVERSITY LECTURER IN MEDICAL CHEMISTRY, CAMBRIDGE

SINCE glucose (dextrose) is the form in which sugar is found in the blood in the post-absorptive condition, it has been claimed that the most natural way to administer soluble carbohydrate by the mouth is in the form of glucose. There seems to be an increasing tendency for the prescription of glucose and the avoidance of sucrose. It is the purpose of this paper to draw attention to certain experiments which seem to indicate that in some cases better results might be obtained by the administration of sucrose and to stimulate inquiry into the relative merits of the two sugars.

As is well known, sucrose is not absorbed as such into the blood. It must first be hydrolysed in the duodenum into equal parts of glucose and fructose (lævulose) by an enzyme known as invertase or sucrase, the mixed sugars being generally known as "invert sugar." It might be concluded that the rate of absorption of sugar into the blood after taking sucrose might be very slow as compared with glucose. But judging from the effects on the level of the sugar in the blood the difference does not seem to be significant. C. F. Cori has shown that the maximum rate of absorption of glucose from the intestine (it is not absorbed from the stomach) is independent of the amount taken, unless the amount ingested be very small. The rate of absorption is the same after taking 25 g. as after taking 200 g. An average man of 70 kg. can absorb about 60 g. an hour, no matter how much is given. As is well known to those accustomed to sugar-tolerance tests the maximum level of blood-sugar in a normal individual, taking 50 to 200 g. of glucose, is reached at about the end of an hour. This is not due to the fact that all of the glucose has been absorbed, but to the influence of the absorbed glucose on the rate of storage of glycogen and on the oxidation of the sugar. The sugar disappears from the blood faster than it is absorbed.

It is a fact that fructose is absorbed at about half the rate of glucose, but this does not explain the fact that there is no very definite rise in blood-sugar in normal individuals when moderate doses of fructose are taken. Fructose is very rapidly stored as glycogen by the liver, and possibly it is utilised by the tissues more rapidly than is glucose. Fructose has been used as a test for hepatic insufficiency. In such cases the rate of formation of hepatic glycogen is decreased and the ingestion of fructose is followed by a rise in sugar in the blood, the sugar being fructose and not glucose.

That fructose is more rapidly metabolised than glucose was demonstrated by H. J. Deuel.[1] The basal metabolic rate and the respiratory quotient rose in a few minutes after taking 75 g. of fructose, whilst after the same amount of glucose only a slight rise was obtained at the end of an hour. Sucrose gave a very striking result. There was no delay due to the time required for the action of the invertase enzyme. The rise in the metabolic rate was as rapid and as extensive as with an equivalent amount of fructose. And yet sucrose gives only half the amount of fructose, the other half being glucose, which, as we have seen, has only a slight action.

Another instance of the peculiar action of sucrose is seen in its ketolytic action. Deuel, Gulick, and Betts[2] tested the power of various sugars to aid the combustion of the ketone bodies that appear either by withdrawing carbohydrate from the diet, or by submitting to starvation for about four days. They found that fructose is more effective than glucose in decreasing the ketosis and alleviating the acidosis. Sucrose is more effective and certainly more rapid than fructose and shows a marked superiority to glucose. The protein-sparing action of the sugars was also investigated. It was found that the excretion of nitrogen in the urine was decreased by taking sugar. In three of the five experiments sucrose had a greater protein-sparing action than glucose.

Z. Dische and H. Goldhammer[3] performed some interesting experiments on dogs which had been trained to do heavy muscular work on a treadmill. The exercise causes a lowering of the blood-sugar and of the inorganic phosphorus, with a rise in the acid-soluble phosphorus. The previous administration of glucose (1·5 to 3 g. per kg.) or fructose has little effect on these results, but the oral administration of the equivalent amount of sucrose inhibits this fall in blood-sugar, and in some cases leads to a rise. The fall in the inorganic phosphorus after sucrose is much less marked, whilst the acid-soluble shows a very slight fall instead of the usual marked rise.

The difference between the action of glucose and fructose given as invert sugar and of sucrose itself may possibly be due to the fact that fructose, as it exists in the sucrose molecule, is in a different configuration to that which it assumes when it has stood for some time. As it exists in sucrose it is a furanose, a five-membered ring compound. On standing it passes into the more stable pyranose, a six-membered ring. It is conceivable that it is absorbed into the blood as the highly reactive furanose, amenable to a rapid oxidation, and capable of inducing reactions that only take place very slowly with glucose, which is a pyranose. I have not been able to trace any experiments that bear on the problem, but it seems of sufficient importance to warrant an attack. It may result in the demonstration that sucrose is unique as a foodstuff in its capability of yielding a certain amount of its energy to the body in the shortest time. As long ago as 1899, Zuntz drew attention to the favourable effect of sucrose on muscular work. It would be of considerable interest if some of our athletic students were to test their powers of endurance after taking glucose and sucrose. It has been shown by C. F. Cori and G. T. Cori that glucose and fructose are on a par as regards the production of liver glycogen. This indicates that cane sugar can be utilised by the body for the building up of a store of energy for later use. I feel that pure cane sugar, recrystallised as it is, from either cane or beet, is preferable as a foodstuff to commercial glucose. This is a very soluble compound, and a recrystallised product is too expensive for ordinary use.

[1] Jour. Biol. Chem., 1927, lxxv., 367.
[2] Ibid., 1932, xcviii., 333.
[3] Biochem. Zeits., 1932, ccxlvii., 8.

Most normal children have a craving for sweets. The report of the debate held four years ago on the importance of sugar in the diet of the school-child [4] appealed to me as a most valuable defence of those who allow their children a fair ration of sugar and sweets. It is possible that further experimental work may demonstrate that sucrose may be of great service in certain cases where there is a call for a carbohydrate supply of immediate availability.

THE USE OF "PROSTIGMIN" IN THE TREATMENT OF MYASTHENIA GRAVIS

By E. A. Blake Pritchard, M.D. Camb., M.R.C.P. Lond.

ASSISTANT PHYSICIAN, HOSPITAL FOR EPILEPSY AND PARALYSIS, MAIDA VALE; ASSISTANT IN THE MEDICAL UNIT, UNIVERSITY COLLEGE HOSPITAL; PHYSICIAN, WESTERN OPHTHALMIC HOSPITAL

In 1934 Dr. M. B. Walker published [1] a description of the unmistakable improvement that she had noticed in a case of myasthenia gravis as the result of giving physostigmine. On Feb. 8th, 1935, she showed before the clinical section of the Royal Society of Medicine two cases of the same disease in which the most dramatic and complete relief of symptoms had been repeatedly brought about by the use of Prostigmin.* A full description of these cases will appear in the *Proceedings* of that society.

This demonstration of Dr. Walker's is certainly the most important step so far made in the treatment of myasthenia gravis.

In respect of the clinical effects of prostigmin the present communication provides only confirmation of the facts already fully stated by Dr. Walker. Of the seven further cases described all have shown a striking and immediate relief of symptoms to a degree that has not hitherto been found with any other remedy. In respect of the mode of action of this drug, further facts are here given: they suggest that its site of action is the same as that of the pathological process causing myasthenic weakness.

Each of the seven patients has been examined just before and just after the injection into the buttock of prostigmin and atropine in the dosage suggested by Dr. Walker. The atropine is given to counteract the effect of the prostigmin in causing slowing of the heart and peristalsis of the bowels. In each a measure of the maximum power of voluntary flexion of the fingers before and after has been obtained by means of a recording dynamometer. In three it has been possible to obtain also myographic records of the tension developed in these muscles on electrical stimulation of the motor nerves both before and after injection. The only untoward symptoms produced by these injections have been a feeling in or around the eyes variously described as a feeling of "stickiness" or "hardness" of the eyes, of "tightness" around the orbits and the feeling experienced when looking at an unpleasantly bright light, an increased flow of tears, and fibrillary twitching in the eyelids, the lips, or the muscles of the neck, the arms, and the calves.

[4] THE LANCET, 1931, i., 243.
[1] THE LANCET, 1934, i., 1200.

* Prostigmin is dimethyl-carbamic ester of m-hydroxy phenyl-trimethylammonium-methylsulphate, an analogue of physostigmine, and is manufactured by the Hoffmann-La Roche Chemical Works, Ltd.

CASE RECORDS

Case 1.—Miss A., aged 34. Weakness of limbs first noticed 15 years ago; bilateral ptosis, constant diplopia, nasal regurgitation of fluids, inability to raise arms to level of shoulders all developed in the course of the first 12 months. Treated at intervals with pituitary extract, adrenaline, and ephedrine; the last had been taken constantly since December, 1932, and the condition was stationary. Under my observation since June, 1934.

Condition before injection.—Left eyelid partially covers pupil; right eyelid covers upper edge of iris; further elevation impossible. Eyes cannot be completely closed by voluntary effort; they do not close during sleep. Divergent squint on forward fixation—right eye fixing. No movement upwards or to right of either eye; movement to left of right eye poor, of left eye full; relatively good downward movements. Jaw cannot be held shut and is habitually supported by one hand. Lips cannot be brought together so that distension of cheeks and whistling impossible. Voice strongly nasal and speech very difficult to understand. Maximum walking distance when rested, two miles. Arms much weaker than legs, cannot extend wrists with fingers fully extended. Grasps (dynamometer): right and left separately, no measurable force; both hands together 5 lb. Tendon reflexes all present but weak.

Two minutes *after injection* of 5 c.cm. prostigmin (total 0·0025 g.) and atrop. sulph. gr. 1/100: right hand grasp 5 lb., left 5; at five minutes right 17 lb., left 10; at twenty minutes right 19 lb., left 14. Thirty-five minutes after injection both eyelids could be raised to expose conjunctiva above the iris; the eyes could be held closed with considerable force; there was no squint on forward fixation or on extreme deviation to left; upward movements were improved but poor; movements to right of both eyes through about half normal range were present: the teeth could be tightly clenched, the lips firmly apposed; the cheeks were tightly distended, the patient whistled, and speech though still slightly nasal was clear (Fig. 1). All these improvements began to appear within five minutes of the injection and progressed at least during the following thirty minutes. After three hours the movements of the face and eyes were weakening again, and after seven hours the condition had reverted completely to that before injection.

Case 2.—Mrs. B., aged 33. Divergent squint with diplopia, left ptosis, incomplete closure of eyes, nasal regurgitation of fluids on swallowing, and increasing weakness of neck and arms for two years. Under my observation for 12 months during which condition was stationary while patient was receiving ephedrine.

Condition before injection.—Left eyelid ptosed to cover half pupil; slight upward movement possible; voluntary full closure of lids impossible; resting divergent squint with lateral deviation of left eye; eye movement upwards absent, downwards good, to left good on left and poor on right, to right absent. Lips can be held closed but cheeks not distended; voice extremely nasal, palate elevation absent; hand grasps (dynamometer) R = 19 lb., L = 16. Tendon reflexes all brisk.

After injection of prostigmin 5 c.cm. and atropine sulphate gr. 1/100 the following changes began to appear in five minutes and increased up to twenty minutes: the ptosis disappeared, the upward movements of the eyes greatly increased but not to normal, the resting squint and the diplopia disappeared, and the movements of both eyes to the left were full in range and well sustained; movements to the right appeared but only through about 30°. The lids could be kept closed with almost normal strength; the cheeks could be tightly distended, and the patient could whistle; the palate elevated well, the nasal quality of the voice almost disappeared, and swallowing fluid without digital pressure on the side of the neck became possible. The hand grasps increased to R = 25 lb., L = 17 at five minutes, and to R = 26 lb., L = 21 at thirty minutes.

Case 3.—Miss C., aged 32. Onset with difficulty in walking and in use of arms for polishing furniture, and ptosis five years ago. Since then much deterioration with diplopia, bilateral ptosis, nasal voice and nasal

regurgitation of fluids, inability to raise arms to horizontal, and inability to walk more than a few steps in succession. Under my observation for the past three years, with steady improvement up to present condition with ephedrine.

Condition before injection.—Bilateral ptosis greater on left, constant diplopia on looking to left but no squint; movements of eyes upwards greatly restricted, downwards normal, laterally restricted in range andpoorly maintained especially to the left. Closure of eyelids just possible but extremely weak; closure of lips possible but no distension of cheeks, palatal elevation very poor, voice weak and nasal, and speech difficult to understand; neither arm can be elevated straight above head; hand grasps R = 5 lb., L = 5.

Five minutes *after injection* of 5 c.cm. prostigmin and atropine sulphate gr. 1/100 ptosis definitely less, closure of eyes and of lips stronger, hand grasps R = 15 lb., L = 10. At the end of thirty minutes the facial expression had entirely altered, there was no ptosis, upward movements of the eyes were full in range, lateral movements were full in range and steadily maintained without diplopia, closure of the eyelids and lips and distension of the cheeks all appeared of normal power; the palatal elevation increased, and the nasal quality of the voice became much less, the arms when held straight above the head could be passively depressed only with difficulty, and the hand grasps were R = 35 lb., L = 28. The myographic record on electrical stimulation became completely normal in form.

CASE 4.—Miss D., aged 19. For three years increasing feeling of stiffness and weakness of the face; voice fades to whisper after talking; frequent nasal regurgitation of fluids; difficulty in chewing, cannot eat an apple; drooping of eyelids, occasional diplopia in all directions; difficulty in holding up umbrella and in walking. Under my observation for the past five weeks.

Condition before injection.—Bilateral ptosis, restriction of upward movements of eyes, great weakness of closure of eyes and of lips—elevators of upper lip used in showing teeth—unable to whistle, nasal voice. Rapid fatigue of deltoid muscles, hand grasps R = 15 lb., L = 12. Tendon reflexes sluggish. Stimulation of ulnar nerve gave typical myasthenic myogram at high frequencies.

After injection of 4 c.cm. prostigmin and atropine sulphate gr. 1/100 the patient commented spontaneously

FIG. 1 (CASE 1).—In each of these photographs the patient is making her maximal effort to distend the cheeks with air. Before injection of prostigmin (left) the weakness of the lip musculature did not allow any detectable inflation of the cheeks. The improvement after injection is seen on the right.

on improved swallowing (of saliva) five minutes later. The ptosis was then much less, closure of eyelids and lips much stronger; air was retained in cheeks under increased pressure; hand grasps R = 20 lb., L = 15. After thirty minutes there was no ptosis; the strength of closure of eyelids and of lips was normal; the cheeks were strongly distended with air, and she found herself able to eat an apple. The hand grasps were R = 25 lb., L = 17. Stimulation of ulnar nerve gave normal myogram at all frequencies.

CASE 5.—Mrs. E., aged 27. Onset with weakness of arms two years ago. This increased and walking became difficult but no further symptoms developed until five weeks ago when ptosis and transitory diplopia appeared and some difficulty in talking. Treated with ephedrine for three weeks with distinct improvement; relapse two days after ephedrine was discontinued. Under my observation only during period of ephedrine treatment.

Condition before injection.—Slight bilateral ptosis, greater on the left; no squint or diplopia; closure of

FIG. 2 (CASE 5).—In these photographs the patient is making a maximal effort to show her teeth with the jaws shut. The weakness of the retractors and the substitution of the elevators of the upper lip is seen in the left-hand photograph, taken before injection of prostigmin. The increased power of the retractors after injection is seen on the right.

eyes and of lips of very poor power with only slight distension of cheeks and weak voice which fades quickly on use. Maximal power of flexion of right fifth finger when hand and arm fixed is about ½ lb. weight. Myographic records on electrical stimulation of typical myasthenic form.

After injection of 5 c.cm. prostigmin and atropine sulphate gr. 1/100 improvement was detectable in five minutes, and maximal in twenty-five minutes. There was then no ptosis; closure of the eyes and lips and distension of the cheeks were all of normal power (Fig. 2), the voice was firm and did not tire, and the maximal pull exerted by the right fifth finger had increased to 5 lb. weight. The myographic records had become completely normal (Figs. 3 and 4). The degree of improvement was altogether out of proportion to that obtained with ephedrine.

CASE 6.—Miss F., aged 21. In October, 1932, noticed drooping of left eyelid and wandering laterally of left eye when tired two weeks later. In February, 1933, increasing weakness of limbs with diplopia on looking to the left or upwards and frequent nasal regurgitation of fluids. Treated with ephedrine for eighteen months with steady slight improvement. Back at work as waitress since August, 1934. Under my observation for the past two years.

Condition before injection.—Slight ptosis of left lid, much restricted upward movement of eyes, constant diplopia and divergent squint on looking to left side; weakness of closure of eyes and of lips with poor distension of cheeks. Hand grasps (dynamometer) R = 17 lb., L = 19.

Five minutes *after injection* of 3 c.cm. prostigmin and atropine sulphate gr. 1/120 no ptosis, no diplopia, no squint on looking to left but deviation of eyes unsteady, range of upward movements and force of closure of eyes increased. After twenty minutes deviation of eyes to left full in range and steadily maintained without diplopia or squint; full range of upward movements of eyes; closure of eyes and of lips of normal strength and cheeks distended forcibly. Hand grasps R = 30 lb., L = 28.

CASE 7.—Mrs. G., aged 48. Onset with diplopia and weakness of limbs ten years ago. Weakness increased until patient bedridden with constant diplopia, extreme difficulty in swallowing, and voiceless. Since this time

several periods of remission and relapse have occurred; within the past month limbs more weak. Not under my observation since April, 1934.

Condition before injection.—No ptosis, squint, diplopia, or restriction of eye movements; closure of eyes, apposition of lips and distension of cheeks weak. No nasal speech, no difficulty in swallowing. Uphill journey from house to neighbouring church only possible with aid of sticks and with five periods of resting. Hand grasps R=21 lb., L=24.

After injection of 5 c.cm. prostigmin and atropine sulphate gr. 1/100 the strength of closure of the eyes and lips and of distension of the cheeks was improved in five minutes and normal in fifteen. Twenty-five minutes after injection the hand grasps were R=34 lb., L=30. An hour after injection the patient made the above journey without the aid of her stick, without resting once, and without immoderate fatigue.

DISCUSSION

Evidence with regard to the actual site of the neuromuscular disturbance responsible for myasthenic weakness has hitherto been almost entirely negative. No structural changes have been found in the nerves, in the nerve-endings, or in the muscles that could be consistently related to the symptoms in any given case. The most recent examination of the chemistry of excised muscle in this and in other cases of muscular weakness by S. Nevin [2] has failed to reveal any changes characteristic of myasthenia gravis. By exclusion, attention has been directed to the myoneural junction as being possibly the site of these changes.

In 1934 I showed [3] that if the ulnar nerve of a patient suffering from myasthenia gravis is stimulated electrically with condenser discharges at a high frequency of repetition, the tension developed in the flexor muscles of the fifth finger produced a characteristic myographic record which differed strikingly from that of normal persons and from that of any cases of muscular weakness other than myasthenia. The form of this curve provided direct confirmatory evidence that the weakness in this condition is due to a disturbance of the myoneural junction. Now that it can be shown that prostigmin restores the myogram to the normal form while simultaneously restoring the patient's strength, this evidence is greatly increased in value.

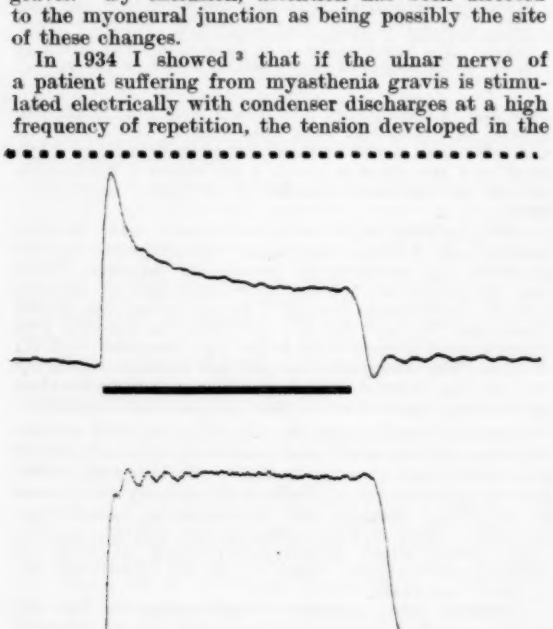

FIG. 3.—Myograms from a patient with myasthenia gravis before and after injection of prostigmin. In taking these myograms the patient was seated before a table to which the right forearm was rigidly fixed in a plaster case which permitted movement only of the fifth finger. This finger was connected with an isometric myograph recording optically on photographic film. The ulnar nerve was stimulated through an electrode strapped to the arm just above the elbow; the indifferent electrode was on the opposite calf. Stimulation was by condensor discharges at varying frequencies provided by a rotating commutator. Signal marker below (black line); time marker above, 1/10th sec.
The frequency in the above pair of records was 220 per sec. The upper record, taken before injection of prostigmin, shows the characteristic fall of tension during maintained stimulation; the lower, taken 20 minutes after injection, is in every way normal.

[3] Brain, 1934, lvii., 239.
[2] Jour. of Physiol., 1933, lxxviii., 3 P.

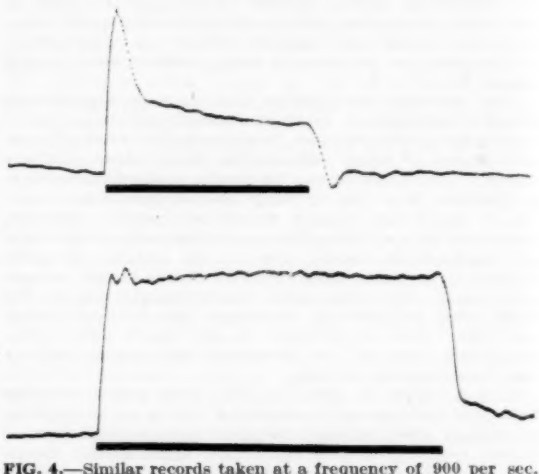

FIG. 4.—Similar records taken at a frequency of 900 per sec. Above, before injection. Below, 20 minutes after.

The effect of prostigmin (an analogue of eserine) in bringing about the above changes concurrently is probably due to its property of delaying the destruction of acetylcholine at the motor ending by the choline esterase normally present in the blood. The results of H. H. Dale and W. Feldberg [4] so strongly suggest that the liberation of acetylcholine is concerned with the normal transmission of excitation from the somatic motor nerve-endings to the voluntary muscle-fibres that an explanation of myasthenic weakness in terms of a disturbance of acetylcholine liberation or destruction seemed likely, and is now almost unavoidable in view of the remarkable effect of prostigmin both on the clinical weakness and on the characteristic myogram of myasthenia gravis.

SUMMARY

(1) Seven patients with myasthenia gravis have been treated with injections of prostigmin and atropine sulphate. (2) In each of these patients some improvement has been clearly demonstrable within the first five minutes after the injection and a degree of improvement far greater than that obtained with any other known treatment has resulted within thirty minutes. (3) This effect has passed off almost completely in eight hours. A further injection resulted in recovery as before. A control injection with saline, after previous prostigmin—so that the patient was expecting a good result—gave only slight improvement in the hand grasps and no other symptomatic improvement. (4) In the three patients in whom myographic registration has been possible this

[4] Ibid., 1934, lxxxii., 121.

(*Continued at foot of opposite page*)

MEDICAL SOCIETIES

ROYAL SOCIETY OF MEDICINE

SECTION OF OBSTETRICS AND GYNÆCOLOGY

A MEETING of this section (with the Eugenics Society) took place at the Royal Society of Medicine on Feb. 15th, Mr. EARDLEY HOLLAND, president of the section, in the chair. The subject was

Sterilisation of Women: Medical, Eugenic and Legal Positions

Mr. VICTOR LACK thought the vast majority of practising gynæcologists were fairly well agreed on most of the cases in which they considered the procedure was desirable; while some would seldom do it, others would do it fairly frequently. The first indicated group met with were the chronic diseases which, despite temporary improvements, ran a downhill course, and the expectation of life of the patients was diminished; such were chronic rheumatic carditis, chronic nephritis, diabetes, and such nervous diseases as disseminated sclerosis. A pregnant woman with one of these diseases became worse at this time, and ran a serious risk to life. In some instances the woman could be allowed to have one or more children before being sterilised, while in others pregnancy ought to be completely barred. In some hospital cases the mother was not fit to look after her child after she had borne it, and sterilisation should be considered to prevent the arrival of still more children. If a woman had mitral stenosis of moderate degree, Cæsarean section might be advised, followed by sterilisation at term. In severe cases it might be necessary to terminate the pregnancy and sterilise as soon as the diagnosis was made. In the second group were diseases from which it was, theoretically, possible to recover, such as pulmonary tuberculosis, and tuberculosis elsewhere, and hyperthyroidism. He had seen a woman with severe hyperthyroidism recover and go through a normal pregnancy, but this was probably an exceptional occurrence. The third group embraced mental diseases, including epilepsy. His own custom in regard to this group was as follows. If a patient had previously had puerperal insanity without a non-recurring cause, such as severe toxæmia, and he was told at a mental hospital that she ran a grave risk of having a recurrence of mental breakdown in another pregnancy he would sterilise. Some patients with a bad family history of mental disease habitually produced mentally deficient children, and such a patient he would not hesitate to sterilise if she desired it. Whether it was permissible to sterilise a mentally deficient woman after empyting her uterus was a medico-legal point. Epileptics presented a difficult problem; they produced a slightly higher proportion of mentally unstable children than the average, but as they also produced a large proportion of normal children, it was not justifiable to sterilise them. Epilepsy was worse during pregnancy, and some women were epileptic only in pregnancy. In a bad epileptic he considered that sterilisation was justifiable.

With regard to obstetrical and gynæcological indications, the commonest single indication was after repeated Cæsarean sections; if a woman had suffered three of these her permission for sterilisation should be sought; further pregnancies threw an undue risk on the mother. Whether the lower segment operation could safely be repeated more often he did not know. There were few indications from the gynæcological point of view; it might be justifiable to sterilise in the course of an extensive repair operation on the pelvic floor, especially when that was combined with ventro-suspension of the uterus. A further cause was osteomalacia, a rare condition in this country. A few women repeatedly developed severe toxæmias during their pregnancies and failed to carry to term; sterilisation of such would save them further risk. Hereditary diseases, as in female transmitters of hæmophilia and acholuric jaundice, also justified the procedure.

Very few, he thought, would sterilise for all chronic disease, and he never did it except in association with pregnancy. It was done immediately after the evacuation of the uterus, or after Cæsarean section, or, thirdly, fairly soon after a spontaneous delivery or spontaneous abortion. The cases on which there was most difference of opinion were those in which the mental condition of the patient was called in question.

Dr. C. P. BLACKER (Eugenics Society) spoke first of the history of sterilisation in this country. In the past it had been too much bound up with the problem of mental deficiency, though the Brock Departmental Committee included in its purview a number of other groups. The Wood Report on the subject gave an estimate of 300,000 mental defectives in England and Wales, and recommended institutional care for 100,000 of these, which would mean quadrupling the accommodation under the Mental Deficiency Acts available in 1929. Two-thirds of the total would thus be left outside institutions, and it was from these that the danger of undesirable procreation was to be feared, though it did not necessarily follow that the children of defective parents would themselves be defective.

The Brock Committee, he said, opposed the principle of compulsory sterilisation, but recommended that voluntary sterilisation, stringently safeguarded, should be available for the following four categories of people: (1) those who were mentally defective; (2) those who had recovered from a mental disorder; (3) persons who exhibited, or were deemed likely to carry, in genetically latent form, a physical disease or defect of a hereditary kind; (4) people who were deemed to be probable carriers of mental diseases or defects. Being looked upon as authoritative, this Report had had a great influence upon public opinion. With regard to heredity, the Brock Committee investigated the children of 3733 mentally defective parents, mostly women, of whom no less than 66 per cent. had had one or more illegitimate children. These mothers had had 8841 children, of whom 22·5 per cent. had died. Approximately 45 per cent. of the children of these mentally defective parents were either themselves mentally defective or mentally retarded, and only about 1 per cent. were regarded as "superior." Most authorities took

---

Dr. BLAKE PRITCHARD: (*Continued from previous page*) clinical remission of their symptoms has coincided with a change in the curve of tension developed under electrical stimulation from the form characteristic of myasthenia gravis to the normal form.

My thanks are due to Dr. M. B. Walker for discussing her results fully with me before I had used this preparation, and for advising me with regard to its dosage; to Dr. F. M. R. Walshe for giving me access to two of his patients; and to Dr. J. S. Dawson for his help in the preparation of the illustrations.

the view that the majority of cases of mental deficiency were attributable in general to genetic rather than to purely environmental causes; in other words, primary aments out-numbered secondary aments. Tredgold had stated that 80 per cent. of mental deficiency was primary, leaving only 20 per cent. as secondary. By no means all the 80 per cent. had parents who were mentally defective; about 5 per cent., according to Tredgold, had one or both parents mentally defective. The more thorough the investigation of parents, the higher was the proportion found to be certifiable, but not certified, mental defectives. Each pedigree should be carefully examined, and it should not be decided that all people about whom a certain diagnosis had been made should be sterilised. The subject of physical defects was too great to deal with in a short speech.

Voluntary versus compulsory measures.—All must remember persons and families as to whom they felt compulsory measures might be appropriate. But the advantages of formulating a law with compulsory clauses to cover such persons would be negligible in comparison with the disadvantages. A drastic sterilisation law came into effect in Germany in January, 1934, containing both compulsory and voluntary clauses; it specified nine conditions—including chronic alcoholism—which were held to justify compulsory sterilisation. Any practitioner in Germany encountering a person who could be diagnosed as suffering from one of these nine conditions was required to notify the case to the authorities. As a result of this, complications had arisen. Much research had been done in that country on inheritance of mental disorder, and accurate information on that depended on truthful pedigrees. If a person felt that by telling the truth about himself he could become a subject for sterilisation, he concealed essential facts. Also, people were reluctant to enter institutions for any treatment lest the dread diagnosis be made and the operation carried out. In this way, treatment of mental disease had been hindered in that country. For a person to be adjudged fit for sterilisation he must have been proved to be anti-social; hence such a diagnosis cast a personal slur or stigma, and interfered with the voluntary application of sterilisation.

In the United States, 27 of the States had passed sterilisation laws, and only in one of them (Vermont) was it purely voluntary. Yet the speaker had been told that 80 per cent. to 90 per cent. of the sterilisations in the U.S.A. were voluntary. In this country, moreover, where sterilisation was strongly objected to by people of certain religious denominations, public opinion would not tolerate its compulsory application to people who objected on moral grounds. What was needed was the creation of a eugenic conscience, so that people, guided by their reason, could come forward and apply for the operation to be done on them.

Safeguards.—He said that advocates of the measure had to face two camps of critics. The first were defenders of the "liberty of the subject" who maintained that, like contraception, this was purely a matter for the decision of the married couple. Hence it was an infringement of personal liberty to demand medical certificate and approval by Government departments. In the other camp were those who declared that voluntary measures were but the thin end of the wedge, the thick end of which was compulsory sterilisation along the lines of the German law. If sterilisation were too easily brought about it was not difficult to envisage practitioners setting themselves up specially to perform it, and if it became fashionable or the vogue, people might flock to such practitioners for the purpose. Therefore the Brock Committee recommended that the candidate's application, backed by two medical certificates, should come before the Minister of Health, who, guided by a small advisory committee, would have power to authorise or veto the operation. Dr. Blacker thought that safeguards should not be insisted upon at first, since it would be disastrous for this country to rush into ill-considered legislation.

Mr. CECIL BINNEY, Barrister-at-Law, explained what, in his view, was the present attitude of the law on the subject of sterilisation. There was, he said, no definite section of the law which forbade sterilisation, but that omission did not necessarily mean that sterilisation was always permissible. Most of his remarks would apply to eugenically prompted sterilisation rather than to sterilisation for reasons connected with health. To sterilise a person against her wish, as in the case of any other operation, must be against the law. It might be unlawful even if the person did consent, therefore it must be considered whether there were any circumstances under which it was legitimate, and, if so, what they were. Sterilisation could be brought into the category of various crimes which were defined as offences against the person, obvious gross examples of which were murder and rape. It had been long held that a person could not consent to being maimed; therefore if a surgeon were to castrate a man at the man's request and that was not for reasons of health, the surgeon would be guilty under that section. The slightest medical operation done contrary to the person's consent was a common assault. A police surgeon had been convicted of an offence for taking off a female's clothes for making an examination of her. Could sterilisation of a person be rightly described as maiming? It was not now practicable to sterilise a person without wounding him, therefore sterilisation could constitute the offence of unlawful wounding. As there were circumstances under which it was justified, it was important to settle what those circumstances were.

In cases in which the operation was done to save life, or when pregnancy would be bad for the woman's health, the surgeon was as much justified in carrying out sterilisation as in amputating a leg to preserve life or health. If the sterilisation were done for a reason not recognised by the law as adequate, the operation was an offence. The doubtful cases were those in which the reasons given were not those of health but of eugenics. The argument that the latter was for the ultimate benefit of the race he did not think would be accepted by the courts, which were unwilling to inquire too far into ultimate benefits which might arise. It must be remembered that it was possible to produce a "public mischief" by sterilising somebody. Such a case as the following could arise. A qualified or unqualified medical man might establish himself in a slum area and offer to sterilise the young women of the locality, presenting it as a blessing to them, saving them much worry and anxiety; and one could imagine an indignant mother commencing a prosecution against such a practitioner. In these circumstances one could not be certain it would not be adjudged a public mischief.

The position in regard to lunatics and mental defectives, he submitted, must be the following. If sterilisation was forbidden by law even in the case of persons who could consent, how much more was it an offence in the case of a lunatic or mental defec-

tive? Sterilisation of a person against his consent must be illegal. It might fall under the provisions in the Mental Deficiency Act and the Lunacy Act which forbade any kind of ill-treatment of mental defectives or lunatics, which could include surgery for any reason other than health. The conclusion therefore was that though sterilisation of a person for reasons of health was always lawful, to sterilise a person for eugenic reasons was probably unlawful. To sterilise mental defectives and lunatics was certainly unlawful except in cases where health considerations rendered it necessary.

Mr. VIVIAN B. GREEN-ARMYTAGE said that a reliable technique for tubal sterilisation had been an objective for surgeons for years. It had been said that hysterectomy was the only safe procedure, but extra-uterine gestation in the tubes had been recorded as occurring after vaginal hysterectomy. Apart from X rays and the uncertain biochemical method of injecting intramuscularly fresh semen of the husband, sterilisation could be divided into (*a*) temporary, (*b*) permanent. In the first of these the principle depended on mobilising the terminal inch of the Fallopian tubes and making use of the technique employed when transplanting ureters into the bowel. The free end of each tube was slid into a letter-box slit in the broad ligament, fine catgut was used for closing loosely the openings, and the operation was completed. The operation was simple and bloodless. Care must be taken that the vascular supply of the distal ends of the tubes was not disturbed. Being only temporary, it overcame the objection of women who refused to be rendered permanently unable to conceive, especially in the event of re-marriage. Many instances of pregnancy after this procedure had been recorded.

An extraordinary capacity of tubal epithelium to regenerate sometimes compelled the surgeon to change his technique. The Madlener method consisted of crushing an inch of the tube and its immediate mesosalpinx, and tying a double loop of thread. In a small percentage of these cases it was seen that the oviduct had reconstructed itself under the ligated area, hence it was not a certain procedure. A method which was successful in 90 per cent. of cases was that of ligation in two places and resection of the intervening inch, retouching the cut ends of the tube with pure carbolic, or, preferably, with a fine cautery. Salpingectomy was as near being ovum-proof as possible. Sleeman's method was also simple and practically bloodless.

The foregoing were carried out by the abdominal route. Some women had a strong aversion to laparotomy, and for those cases he had devised a technique which was simple, and was secure in 99 per cent. of cases. It could be performed in nulliparæ, and in those who had had children. It consisted of opening the utero-vesical pouch per vaginam, the bladder being retracted. Using two cat's-paws, the uterus was anteverted and brought down. If the vagina was patulous, there would be no difficulty in delivering the fundus of the uterus through the opening in the utero-vesical pouch. Then the corneal end of each tube could be excised and sewn over, the cut distal portion being buried and peritonealised. The uterus was replaced, the cut edges of the peritoneum were sewn, and the vaginal incision was closed.

Dr. AUBREY LEWIS remarked that the psychiatrist was often confronted with the problem of sterilisation in an urgent way. He observed the painful results of propagation in people, who if sterilisation had been available to them, might have been spared bringing into the world children having the same disabilities as themselves. The indications for therapeutic sterilisation were not to be found in any general rule but rather in study of the individual case. Thus many women who had a psychosis during pregnancy or the puerperium had it only once, other pregnancies being normal; one had to examine the various factors in each case in order to forecast the likelihood of a repetition of the mental illness. The same need for individual study was found in considering the eugenic indications for sterilisation. Statistics of hereditary transmission were available, based on some hundreds of rather heterogeneous cases of dementia præcox and manic-depressive psychosis. They took no account of the subdivisions, and suggested less ground for confidence in giving a genetic prognosis than was in fact often possible in a particular case. One had to disentangle the relative importance of the hereditary and the environmental influences for each patient. One had, moreover, to consider not only the advantage of eliminating undesirable attributes but also that of continuing good qualities. In some instances, a person who had had an attack of excitement or depression had valuable endowments; it was not desirable to decide out of hand that such a person would be well-advised to have himself sterilised because the illness was transmissible.

Those who saw the eugenic aspects of mental disorder would agree with Dr. Blacker's opinion that a eugenic conscience ought to be cultivated among the public. An increasing number of people who attended such a hospital as the Maudsley spontaneously sought guidance on these matters. Dr. Blacker's reference to safeguards was timely, both as regards the patients and doctors. A small proportion of patients who asked about sterilisation did so because of morbid fears or had some frivolous reasons for wishing the operation done; such people needed to be protected against themselves. As regards safeguards for doctors, he had known one instance of resentment, fortunately transient, felt by a woman against the psychiatrist and the gynæcologist who had effected at her wish her sterilisation after several pregnancies each of which had been accompanied by mental illness. He emphasised the need to find a means whereby the surgeon who performed sterilisation in properly attested and willing cases could be freed from anxiety as to legal punishment.

Dr. BINNIE DUNLOP confessed to feeling misgivings as to the Eugenics Society's proposed Bill; by implication that measure would make it illegal for very poor and overburdened women to secure sterilisation. A strong justification for sterilisation was the humanitarian one.

Dr. AIKMAN spoke in support of the proposed Bill of the Eugenics Society, which had been very exhaustively considered, and whose further justification came from researches which had been made in California. There the importance of safeguards against the operation being done for purposes other than because of mental disease was emphasised, as many wished to have it carried out for reasons which a medical man would deem frivolous. In Austria some surgeons and students sterilised 200 men merely as a means of birth control, and the Austrian courts came down upon them heavily for it.

Dr. STEPHAN WESTMANN spoke as a late member of a committee on sterilisation in Germany. The voluntary or compulsory sterilisation now introduced in Germany, he said, is carried out in cases of: (1) innate mental deficiency; (2) manic-depressive insanity; (3) schizophrenia; (4) hereditary epilepsy;

(5) Huntington's chorea; (6) hereditary blindness; (7) hereditary deafness; (8) severe hereditary deformities of the body; and (9) severe alcoholism. The sterilisation "may" be performed on voluntary application of the deficient himself or of the persons in charge of him and "has" to be performed on decision of the respective courts ("Erbgesundheitsgerichte"). The operation consists in the male of a vasotomy, in the female of a salpingotomy. It is prohibited to use X rays or chemical remedies. Also castration is forbidden. The German authorities advise the operation described by Döderlein (formation of a knot of the Fallopian tubes and securing it by means of catgut sutures). According to the official publications the number of congenitally mental deficient persons averages 1 per cent. of the whole population. At least 33 to 50 per cent. of the children of these persons are mentally deficient, and it is proved that the apparently healthy remainder inherit the disposition and are liable to pass it on to their descendants. In the asylum of the City of Berlin (Wittenau) it was ascertained that 58·1 per cent. of the imbecile children had one parent and 72 per cent. both parents mentally defective. As the experiment of sterilisation on a large scale is only in the beginning in Germany, it is advisable to await results before expressing definite opinions.

Mr. ALECK BOURNE described a simple method of producing sterilisation by cauterising the uterine openings of the tubes with the diathermy electrode.

Dr. LETITIA FAIRFIELD suggested that the legal test of the justification for sterilisation in a given case was the same as that for procuring abortion.

Dr. LEONARD FINDLAY thought the diseases in regard to which the strongest case for sterilisation could be made out were deaf-mutism, hæmophilia, and pseudo-hypertrophic muscular paralysis. Much confusion had arisen from grouping together physical and mental conditions.

The openers briefly replied.

REVIEWS AND NOTICES OF BOOKS

Physical and Mental Growth of Prematurely Born Children

By JULIUS H. HESS, M.D., Professor of Pediatrics, University of Illinois, Chicago; GEORGE J. MOHR, M.D., Director, Pittsburgh Child Guidance Clinic; and PHYLLIS F. BARTELME, Ph.D., Psychologist, Cook County Juvenile Court, Chicago. Chicago: University of Chicago Press. London: Cambridge University Press. 1935. Pp. 449. 22*s*. 6*d*.

THE ultimate fate of premature infants has been much discussed. At one extreme is the popular lay belief that they are always "delicate"; at the other extreme is the suggestion that after the first year or so no difference exists between them and full-term children. Various isolated studies on the subject are available, but this monograph represents the most complete attempt yet published to settle the matter by a scientific follow-up system. Based upon the records of nearly 2000 children originally cared for in Dr. Hess's well-known premature infant clinic (where incidentally a survival-rate of about 75 per cent. has been achieved in recent years) statistics and graphs trace the development of body and mind of the maturing child. The studies go back also to the parents themselves, the causes of prematurity, the type of delivery and condition at birth, and then proceed to analyse not only the broad features of physical and mental development but such special problems as habit formation, social adaptation, blood pressure, the rôle and treatment of syphilis in the premature, the prophylaxis of anæmia, the use of oxygen, and the occurrence of inguinal hernia. For these last, contained in the third part of the book and occupying over half its contents, a team of contributors has been coöpted.

The result is a volume full of information, a reference book of the first rank and, especially in the contributions by Dr. Hess himself, a fascinating story of an important piece of work well carried out.

Principles in the Treatment of Inflammation

By T. E. HAMMOND, F.R.C.S., Assistant Surgeon, Royal Infirmary, Cardiff; Consulting Urologist, Welsh National Memorial Association. London: H. K. Lewis and Co., Ltd. 1934. Pp. 210. 10*s*. 6*d*.

THE object of this book apparently is to emphasise the fact that in all cases of inflammatory disease recovery depends upon the reaction of the tissues of the body. In the words of the author, once an inflammation has started "it is with the reaction that now sets in that this book mainly deals." He seems to assume that this fundamental fact is not generally recognised by practitioners; yet all the facts presented in this book are well known and are indeed the very basis of every therapeutic conception. No new phenomena are presented and no new interpretations of them. The attitude of the author to scientific investigation is illustrated by the following passage: "Expressions such as allergy, hypersensitiveness, &c., are used as if their discovery denoted some great advance. Nothing could be more mistaken, for they are just names given to phenomena that were observed years ago." This may be true, but surely the study of these phenomena, their definition and analysis, has necessitated the coining of new words and has added to our knowledge of disease. This intellectual outlook is evidenced in many passages in the book. "What is the advantage," asks the author, "of being able to measure the size of electrons and the speed of light and to send messages round the globe when we are unable to measure vitality or to give man anything to help him in his fight?"

But Mr. Hammond has a definite message to deliver, which is to encourage the study of the natural phenomena of inflammation and particularly to refrain from carrying out any measure that may interfere ever so slightly in its consummation. He is so far in sympathy with homœopathy as to believe that drugs such as mercury and arsenic, or even morphia, in minute doses, may cause such reactions in the tissue cells that resistance to infection may be facilitated; they act in fact as alteratives. Many interesting ideas are set out in this book which will stimulate alike those who agree and those who disagree with its author.

Psychopathology

A Survey of Modern Approaches. Second edition. By J. ERNEST NICOLE, L.M.S.S.A., D.P.M. With a foreword by W. H. B. STODDART, M.D., F.R.C.P. London: Baillière, Tindall and Cox. 1934. Pp. 283. 12*s*. 6*d*.

A SURVEY of psychopathology, which aims to be compendious rather than critical, makes difficult and rather depressing reading. It is not Dr. Nicole's

fault that he falls short of his intention to "marshal some sort of orderly disposition out of the chaos of modern theory." He has separated out various tendencies, it is true—analytical, neurological, physiological, constitutional, and comparative—and he has described others calling themselves characterological or typological, but they are by no means an orderly band. Some of these theories are speculative, some mainly factual but careless about their facts, some are irrelevant, and nearly everyone is out of line with the others. It is impossible to dress them on parade or to make them into a single company, though there are people, mildly rebuked by Dr. Nicole, who take up a shallow "eclectic" attitude, reconciling the irreconcilable and essaying a vain synthesis. This book temperately reviews each of the schools in turn, with an evident bias for the logical formalism of the Freudian scheme. To the earlier edition has been added material bearing on ethnology, sociology, and other fields in which psychology is being studied or to which it is applied. A new chapter on "The Present Position in Psychology" is brief and poor; it departs from the general aim of the work which is to present the various theories with only a modicum of comment. As in the first edition, three essays by Dr. Nicole are appended—the first largely a Freudian exposition, the second a plea for the application of type-psychology, and the third a critical examination of the diverse notions associated with the term "herd-instinct."

Dr. Nicole has clearly taken great pains with his survey which is the only convenient guide in English to all the rooms in this inchoate house; it is therefore to be hoped that in his next edition he will indicate rather better the relative importance of the things he discloses; as it stands, some of the greatest could not well be distinguished by a beginner from the least. Similarly, in his excessively long bibliography many books are listed by authors whose importance for psychopathology would generally be thought inconsiderable. Altogether, the book may be regarded as a useful compendium for examinees or those curious to know how many and varied are the theories of morbid psychology. It is almost inevitable that many who read it will lump the good with the bad and decide to leave the subject alone.

---

1. Adolescence and Marriage

By ROBERT V. STORER, M.R.C.S., L.R.C.P. London: John Lane, The Bodley Head Ltd. 1934. Pp. 325. 8*s*. 6*d*.

2. Fit or Unfit for Marriage

By TH. H. VAN DE VELDE, M.D. London: Chapman and Hall. 1934. Pp. 362. 10*s*. 6*d*.

1. Dr. Storer's book, which is published as one of the series of the International Library of Sexology and Psychology, is not primarily written for doctors and medical students, but "for the parent and teacher so that he may be able to guide the youth in his conflicts and problems and teach the great lesson of sex mastery." But the suggestion in the author's introduction is that it will also meet a need for a concise, authoritative, and comprehensive survey of sexual life written simply and clearly for those of marriageable age. The volume is divided into three parts. The first, dealing with sexual ethics, contains a chapter on sex in ancient Greece, the longest in the book, wherein the statement occurs that the "Greeks were not immoral, but actually more moral than we are to-day, for they recognised the polygamous tendency of the man and acted accordingly; they recognised the homosexual phase of puberty which may become fixed into maturity, and acted accordingly; while we, in spite of possessing the same knowledge, are too cowardly to draw the same conclusions, and are satisfied so long as outward appearances are preserved, to sin in secret so much the more." In subsequent chapters the institution of monogamous marriage, previously condemned as unscientific, is denounced as a product of the unfortunate conjunction of Christianity with Pauline asceticism. The argument leads up to a statement of future ideals as to marriage. In the author's Utopia of the future, young people will, after an expert medical examination, be encouraged to marry about the age of 18, but marriages will be preceded by a preliminary probationary period replacing the present-day so-called "engagement," and during this time annulment may be obtained by consent. Children accidentally born of such love marriages would come under the control of the State until such time as the marital state is confirmed. Moreover "the moment love ceases to exist is the moment for dissolution of marriage unless both parties to the contract, on account of the children or for reasons unconnected with love, wish to play the part of hypocrites."

This summary illustrates the author's approach to his subject. The second part of his book deals with the problems of sexual psychology; the third with sexual hygiene. The sex organs are described and illustrated, the technique of coitus is dealt with at some length, and the book closes with a discussion of birth control. An appendix gives a list of proprietary contraceptives which is presumably intended for persons about to get married rather than for parents and teachers. The book will not be found helpful by most parents.

2. The question of fitness or unfitness for marriage occurs to most people as a personal problem at some time in their lives. Its social aspect has been much discussed. A plea for the prohibition of the marriage of mental defectives has appeared in successive reports of the Board of Control, and quite recently the compulsory production of health certificates before every marriage has been advocated in the House of Lords. It is unfortunate that Dr. Van de Velde's book contributes little towards the solution of the many problems that here arise. It is primarily written for "young people of both sexes, especially before they decide to become engaged." Only in a secondary capacity is it intended for the medical profession. Medical men are not infrequently asked to examine young persons conteinplating matrimony with a view to determining their fitness for the responsibilities of this state. In France it is a frequent practice for the bride's father to ask his future son-in-law to have his life insured, a first-class life being regarded in the light of a certificate of physical fitness for marriage. Dr. Van de Velde's book provides very little practical guidance as to what investigations a doctor consulted on this subject should make, or what questions he should ask. Nor does it provide a summary of the laws and regulations bearing upon the subject which exist in other countries. In 18 chapters, each about 20 pages long, the subject is discussed from so-called biological, psychological, and social standpoints. The problem is, in places, exalted to almost mystical levels. A marriage is regarded as an "organism of a higher kind." Marriage advisers are represented as healers and helpers; the author declares himself in favour of organisations

being created in the universities to train special teachers on marriage questions. He is opposed to compulsory certificates of fitness for marriage; he seems to favour the exchange of voluntary certificates, but gives little indication of how, in his opinion, such voluntary certificates could be drawn up.

---

1. Developmental Anatomy

Third edition, revised. By LESLIE B. AREY, Robert Laughlin Rea Professor of Anatomy, Northwestern University. London: W. B. Saunders Co., Ltd. 1934. Pp. 593. 27*s.* 6*d.*

2. A Manual of Practical Anatomy

Second edition. By THOMAS WALMSLEY, M.D., Professor of Anatomy in the Queen's University of Belfast. Part I.: Upper and Lower Limbs. London: Longmans, Green and Co., Ltd. 1934. Pp. 376. 12*s.* 6*d.*

3. Anatomy of Surgical Approaches

By L. C. KELLOGG, A.B., M.D., Professor of Anatomy, College of Medical Evangelists, California. London: Baillière, Tindall and Cox. 1934. Pp. 134. 7*s.*

4. Aids to Osteology

Third edition. By PHILIP TURNER, B.Sc., M.B., M.S. Lond., F.R.C.S., Consulting Surgeon, Guy's Hospital; and N. L. ECKHOFF, M.S. Lond., F.R.C.S., Assistant Surgeon to the Hospital. London: Baillière, Tindall and Cox. Pp. 222. 4*s.* 6*d.*

1. In its third edition this book has been improved in text and in figures. The author has included much new work emanating from this side of the Atlantic, although its origin is not always made clear. The reference lists at the end of each chapter are a feature in the book which we would like to see copied in many other works. Altogether both author and publishers may be congratulated on the book, which is well adapted to the needs of the student.

2. The first part of a new issue of this excellent manual gives clear signs of careful revision; the volume is nearly twice as long as the corresponding part of the first edition. This increase is brought about largely by a longer and more complete introductory chapter, and by additions to the number of figures; there are also new paragraphs dealing with measurements and anatomical examination of the living. The New English terminology is used throughout, and the book is a guide for students which we can recommend without reservation.

3. In this small book are described many of the surgical exercises on the cadaver set in operative surgery examinations. The instructions are concise and terse and follow the usual plan. A certain number of line drawings depict clearly what they are meant to represent. The book will no doubt be a help to students for purposes of rapid revision.

4. This small volume, although of pocket size, contains a complete account of the descriptive anatomy of the bony skeleton and of its ossification: it is not a synopsis. A work on osteology would be of little value to the student were the description of each bone not complete; but there is a distinct advantage in having a volume that is so easily carried in and out of the "bone room" and the dissecting-room. The facts are presented in a clear and orderly and lucid manner. The anatomy of the fibula, for example, which has a particularly bad reputation for difficulty, is reduced to quite simple terms. As there are no illustrations the student is forced to the handling of the bones themselves—an important habit, as his teachers are always impressing on him. The main alteration in the third edition is the use throughout of the New English terminology.

An Introduction to Experimental Embryology

Second edition. By G. R. DE BEER, M.A., D.Sc., F.L.S., Fellow of Merton, and Jenkinson Memorial Lecturer, University of Oxford. Oxford: Clarendon Press. 1934. Pp. 148. 7*s.* 6*d.*

THIS little book was first published some eight years ago. Dr. de Beer still adheres strictly—and wisely—to his original plan, and any alterations and additions have been made within the confines of this plan. The result is an excellent simple account of the more fundamental notions on development which have resulted from experimental investigations. It is admittedly only an introduction, but it is a very good one.

British Journal of Tuberculosis

UNDER the editorship of Dr. L. S. T. Burrell, this journal begins its twenty-ninth volume with considerable changes both in contents and in external appearance. The format has been altered in favour of a new and clearer type and the cover has been redesigned, though the familiar green colour is retained. Under "Our Future Plans" the editor indicates that the journal will in future be more clinical and will include in each number a clinical case, an essay on some subject of interest, and a consultation. The section of consultations should be valuable; the first case has been entrusted to the competent hands of Dr. R. A. Young, who discusses the prognosis and gives his opinion what is the best treatment. Suggestions and criticisms on the case are invited. Another new feature is the introduction of abstracts from the literature. The name of Dr. Kelynack remains on the cover as consulting editor.

NEW INVENTIONS

COMBINED TONGUE DEPRESSOR AND TONSIL EVERTOR

AFTER many years' experience I consider this to be a simple and efficient instrument for mouth examinations and particularly for investigating and clearing out septic pockets in the tonsils. Essential points in the instrument are: (1) total length not too long for carrying in waistcoat or side pocket; (2) the round handle; (3) the perfectly smooth,

blunt, and rounded end which will not wound by either cutting or scraping the mucous membrane of the mouth or tonsil; (4) the shallow smooth grooving which is sufficient to facilitate the removal from the mouth of any material which has been squeezed out of septic tonsils.

The depressor has been made for me by Messrs. Allen and Hanbury Ltd., 24, Wigmore-street, London, W.4.

C. G. GIBSON, M.B., C.M. Edin.

THE LANCET

LONDON: SATURDAY, FEBRUARY 23, 1935

A MUNICIPAL MIDWIFERY SERVICE

A DOCTOR or midwife who "books a baby" accepts a contract to render at an uncertain date a service of which neither the difficulty nor the duration can be determined in advance. Moreover, the proper conduct of labour nowadays involves vigilance for months before and weeks after the delivery of the child. No one who considered these facts would be astonished to learn that the practice of obstetrics does not yield a reward adequate to the time and responsibility it involves. But to be told on good authority that the gross earning power of women practising midwifery "habitually and for gain" is now only some £80 a year is disturbing enough to direct shocked attention to their plight. The scheme designed to raise the status of midwives which is summarised on another page is the outcome of concentrated study of the situation by a representative committee convened for the purpose. The names of those selected to deliberate under the chairmanship of Dr. T. WATTS EDEN guarantee a broad unbiased outlook in every aspect of the problem, and their report deserves detailed study. Their first concern was to marshal the following points of agreement, relevant to their terms of reference, in the many reports, official and otherwise, which have been issued in recent years on the maternity services: (1) domiciliary midwifery should continue to form the basis of the maternity service; (2) the *nursing* of every maternity case in which a medical practitioner is engaged should be conducted by a qualified midwife; (3) the status and remuneration of midwives should be substantially improved; (4) the training of midwives must be lengthened, improved, and standardised; (5) compulsory post-certificate courses are essential; (6) the general supervision of midwives should be carried out by senior members of their own profession.

It is with the methods by which the third of these proposals should be implemented that this report is chiefly concerned. It is something of a paradox that the plea for the establishment of a salaried midwives' service under the control of the appropriate local authority is based largely on the excellent record of the midwives employed by the county nursing associations. The aim is now to extend the advantages exemplified in the districts staffed by voluntary bodies with salaried nurse-midwives to urban and industrial areas. There is no intention to disturb any existing arrangements which are working well; but in order to enable the voluntary nursing associations to cover adequately the area allotted to them, and to pay salaries and pensions on the same scale as the local authorities, it is proposed that further grants be made to them from public funds. It may be observed in passing that free migration between these associated services would still be hampered by the absence of an interchangeable pension scheme, but no suggestions for amalgamation in this respect are put forward. It is estimated by the Queen's Institute of District Nursing that about 200 additional midwives would be required to meet completely the needs of rural areas in the 42 counties in England and Wales in which the county nursing associations are affiliated to the Institute; about 800 nurse-midwives, however, are employed by voluntary associations in counties *not* affiliated to the Institute, and no estimate seems to have been supplied to the committee of the additional personnel needed in these counties. The committee give their reasons for believing that about 4500 midwives in all would be absorbed in a salaried service who have not previously been so employed; that the number eligible for compensation on the basis proposed would be under 3500; and that the expenditure involved for compensation would be under £200,000. These deductions from the data available appear to us to be somewhat optimistic, but they represent a sincere attempt to forecast the initial cost to the nation of an organised service of midwives. We say initial cost advisedly, for whether the voluntary nursing associations would long continue the struggle to raise funds for maintaining their village nurse by bazaars, whist drives, and appeals to charity remains to be seen.

The suggestion that midwives entering the municipal service should be accorded the same status in every respect as health visitors has important implications, affecting the whole of the nursing profession. The salary of health visitors varies within very wide limits, but the Queen's nurse-midwife, who is general-trained, mostly receives a lower salary than the average health visitor, and she would benefit indirectly by the subsidy associated with the adoption of the higher scale for municipal midwives. It seems unlikely, however, that local authorities will be persuaded to adopt such a scale until they are satisfied that it will attract women of the desired type to the service. The midwifery services committee hold the view that its adoption would make it possible to raise the period of training required for the attainment of the C.M.B. to a minimum of three years, but give no details of the kind of training contemplated. That this is not a general nurses' training is indicated by their warning that experience of general nursing is not an adequate substitute for experience of the practice of midwifery, and their recommendation that recruits to the municipal service should be drawn from the ranks of midwives who have been in recent practice or have had recent experience in labour wards or districts.

Two points in the report show that the committee are alive to the dangers of disturbing the personal relations between midwife and patient.

First they disclaim any desire to eliminate all independent midwives, recognising that a certain number of successful ones (the grounds for estimating this number at 750 are not stated) will prefer to remain outside the municipal service, and continue in private practice. Doubtless the midwives whose work consists chiefly in nursing maternity cases among well-to-do patients would retain their independence and their private clientèle of doctors. The importance attached to the maintenance of the mother's freedom of choice of midwife will also give satisfaction to those who stand for individualism in all medical services. Under the scheme outlined the expectant mother will be allowed at least to approach the midwife of her choice; whether in practice she would always be able to obtain her services is difficult to say, since the area in which each midwife may practise is to be defined, and the number of cases she is allowed to book for each month is to be limited. But the intention is to allow freedom, and it must be remembered that even under present conditions choice is limited by geographical considerations as well as the previous bookings of the midwife.

Enough has been said to show that this document is characterised by common sense, industry in collecting relevant facts, and ingenuity in interpreting them. Of the alternatives considered by the committee the one they have sponsored seems to be that with least drawbacks, and their report may well prove to be a landmark in the history of the development of the social services.

OPERATIONS ON THE GALL-BLADDER

A FEW weeks ago we drew attention [1] to the view of certain British surgeons that cholecystectomy in the absence of gross pathological lesions and of definite biliary colic may give little relief to the symptoms for which it is performed. This view is further emphasised by the opinions expressed by speakers at a meeting of the surgical section of the American Medical Association held recently in Cleveland, U.S.A. Conservatism in gall-bladder surgery and a due regard for the functions of that organ were urged both in the opening papers and in the discussion which followed. Dr. A. C. IVY gave [2] as definite indications for cholecystectomy the presence of multiple small stones, or advanced inflammatory changes in a gall-bladder which does not reveal itself after administration of dye. Removal of a gall-bladder on the grounds that it was very likely to be the cause of the symptoms and that, in any case, the patient could get on quite well without it and would be saved possible future formation of stones, was condemned by all the speakers. Apart from the fact that the patient may not be cured of his symptoms—as was shown by E. A. GRAHAM and W. A. MACKEY in a careful analysis [3] of 161 patients a year or more after operation—such an attitude disregards the facts that have been brought to light by recent observation on the physiology of the biliary apparatus. IVY, one of the chief workers in this field, has proved that removal of the gall-bladder leads to anatomical and functional changes in the bile-ducts. So far from playing a merely passive rôle, he regards the gall-bladder as having an active part in the secretion of bile. Three functions are assigned to it—viz., concentration of bile, secretion of mucoid fluid, and muscular contraction. Two significant facts emerge from the experimental findings of IVY and of other investigators. The first is that the power of the gall-bladder to contract is not greater than the secretory pressure of the bile. The second is that the sphincter of Oddi, at the lower end of the common bile-duct, becomes incompetent soon after removal of the gall-bladder. Later recovery of competence usually leads to dilatation of the ducts. One of the recognised functions of the sphincter is to close as the gall-bladder fills, and, in consideration of all the evidence available, IVY is convinced that the gall-bladder and the sphincter of Oddi act as a functional unit.

The evidence for the part played by the gall-bladder in the concentration of the hepatic bile is of course undisputed. It is partly on this fact that the radiological visualisation of the gall-bladder depends. But it may not be so well known that animals in which the gall-bladder is absent normally secrete a bile many times richer in bilirubin than those possessing a gall-bladder. In a severely diseased gall-bladder it has been shown [4] by I. S. RAVDIN and his co-workers that this function of concentration is perverted. Fluid is secreted into the lumen of the gall-bladder, instead of being absorbed from it, chloride concentration increases, whilst calcium and bile-salt, normally the most important substances concentrated in the gall-bladder, show a very low value. The degree of damage to the gall-bladder wall is fairly accurately reflected in the composition of the bile contained within it. Cholesterol is most probably secreted directly into the gall-bladder from the blood, a conclusion that agrees with the results of PATEY's experiments [5] on cholesterosis artificially produced in rabbits. Since the examination of hepatic and gall-bladder bile is clinically impracticable, except after drainage operations on the biliary apparatus, the main test of gall-bladder function is by X ray visualisation of opaque dye excreted into the gall-bladder with the bile from the liver. The dye is visible in the radiogram; its shadow becomes denser after concentration and disappears after emptying of the gall-bladder. Non-visualisation is usually taken as evidence of lack of function of the gall-bladder. As RAVDIN points out, it may actually indicate one of three things: a static condition on the part of the gall-bladder; dilution of the dye by fluid excreted in excess by the wall of an inflamed gall-bladder; or merely a very rapid rate of absorption. A faint shadow, or no shadow at all, does not point with certainty to a severely diseased organ. GRAHAM and MACKEY were disappointed in the clinical results of cholecystectomy in such cases. But they

[1] THE LANCET, 1934, ii., 1112.
[2] Jour. Amer. Med. Assoc., Nov. 17th, 1934, p. 1500.
[3] Ibid., p. 1497.
[4] Ibid., p. 1504.
[5] Brit. Jour. Surg., October, 1934, p. 378.

rarely found changes of note in a gall-bladder of normal radiological appearance. The test is of positive value.

IVY describes the functional significance of different types of bile that may be found in the ducts at operation. Green bile is present after obstruction of the common duct for 12–14 days, when the gall-bladder is intact; with the gall-bladder absent or functionless white bile is found. Ducts enormously dilated with a pale water-clear fluid were described not long ago by Mr. NORMAN LAKE [6] in a curious case in which the lower ends of the cystic and common bile ducts were separately obstructed by a pancreatic growth; the two ducts joined just above the ampulla of Vater and the isolated gall-bladder was contracted and its contents semi-solid. White bile is now regarded as an excretion of the ducts and as evidence of lack of hepatic function; it is also found in toxic hepatitis and in hæmatogenous infections. Very dark bile, sometimes seen in the early stages of duct obstruction, may be due to change of bilirubin to biliverdin. Possible cause of failure to relieve symptoms by gall-bladder operations have been suggested. IVY believes that typical biliary colic may be produced by spasm of the sphincter of Oddi. Temporary relief may follow operation during the period of paresis resulting from cholecystectomy. Later the muscle regains its excessive tonus, with recurrence of the pain. Overlooking the presence of a stone in the common bile-duct is a well-recognised cause of failure. GRAHAM urges the importance of thorough examination to eliminate all other possible sources of the symptoms before incriminating the gall-bladder. It is so easy for the gall-bladder to be removed on uncertain clinical grounds, leaving the surgeon to find in slight microscopical changes "solace and justification" (to quote Graham's words) for the operation.

SILICOSIS IN COAL-MINERS

IT has long been the tradition among British students of pneumoconiosis that the disease does not occur among coal-miners, but in the last few years this comfortable belief has been subjected to damaging criticism. Several authorities, notably S. L. CUMMINS and A. F. S. SLADDEN, [7] have described unequivocal examples of silicosis, with or without tuberculosis, in coal-miners, and there can no longer be any doubt about the facts. The occurrence of a limited number of cases of silicosis among the specialised groups of miners whose work consists of drilling through hard stone might have been expected, and it was hoped that the condition was confined to these "hard-headers."

But this is not the view held by Dr. S. W. FISHER, H.M. Medical Inspector of Mines, who, in a paper read before the Institution of Mining Engineers on Feb. 1st, drew attention to the alarming increase of silicosis among coal-miners, especially those in the South Wales field. Dr. FISHER, whose paper gave rise to a spirited and stimulating discussion, stated that the known incidence of silicosis among coal-miners had grown in the last 15 to 20 years from a few cases to over seven hundred; and the really disquieting feature of his analysis of these cases was the demonstration that whereas the earlier ones all occurred among drill workers in siliceous rock, among the later ones were many in which it was not possible to trace a history of such work. Naturally enough Dr. FISHER'S remarks did not pass unchallenged. One critic suggested that inasmuch as the conditions of mining have not materially altered during the last 20 years, the modern development of silicosis might represent a deterioration in the physique of the miner due to a lower standard of living rather than an increase in the silica content of the mine atmosphere. This suggestion, no doubt, is not without its appeal to those who see in a concomitant infection a powerful factor in the development of silicosis, for a lowered nutrition might well be expected to predispose to infection. But at the same time the suspicion cannot be avoided that the statistics which showed a quarter of a century ago a mining population practically free from silicosis are not entirely reliable. Post-mortem examinations are notoriously difficult to obtain in the mining districts in Wales, and it is by no means certain that the death certificates of the past were entirely reliable. What, for example, is the significance of the chronic bronchitis which even to-day is such a common diagnosis in the coal-fields? There are those who regard chronic bronchitis as the essential pulmonary lesion of the miner, and ascribe any pulmonary fibrosis which accompanies it to the paralysis of the normal dust elimination as the result of the degeneration of the bronchial mucosa. Others deny that there is necessarily any failure of dust elimination from the bronchial passages in chronic bronchitis, and hold, moreover, that there is no evidence that coal-dust apart from stone-dust can, even in considerable quantities, produce significant fibrosis—they would suggest that in the past, and not such a distant past either, the diagnosis of chronic bronchitis has cloaked many a case of silicosis.

It is becoming more clearly recognised every day that silicosis does actually occur in industries formerly thought to be free from it, and this in spite of the fact that the dust to which the workers may be exposed contains a relatively small proportion of crystalline silica. An instance in point is the recent demonstration by M. J. STEWART and J. S. FAULDS [8] of the occurrence of silicosis among the Cumberland hæmatite miners. But it is also certain that the diagnosis of silicosis is by no means a simple matter and even a post-mortem examination may not be absolutely conclusive. Every case must be judged on its merits, and every precaution should be taken to ensure that a correct diagnosis is reached. Only in this way will errors be avoided similar to those which have obscured our knowledge and added to our difficulties.

[6] THE LANCET, 1934, ii., 753.
[7] Jour. Path. and Bact., 1930, xxxiii., 1095.
[8] Ibid., 1934, xxxix., 233.

ANNOTATIONS

DEXTROSE VERSUS SUCROSE

IF the average young mother were asked what in her opinion was the most notable advance in therapeutics of the last decade she would probably say "glucose." And she could certainly claim considerable justification. The medical profession, with the willing aid of the daily press, has succeeded in "putting across" this particular form of therapy in a way which if applied to diphtheria immunisation or the prevention of tuberculosis might have really startling results. Children are given powdered glucose with their porridge to eat and to drink with lemon squash, glucose barley-sugar to suck in school, while rectal and even intravenous injections of soluble glucose are commonly prescribed. A brochure issued "to physicians exclusively" by an enterprising commercial firm deals with the remedial uses of dextrose in infant feeding, starvation, ketosis, diabetes, infectious diseases (particularly pneumonia, diphtheria, and encephalitis lethargica), toxæmia, anæsthesia, hyperemesis gravidarum, shock from burns, alimentary intoxication, hyperthyroidism, collapse, nephritis, gastro-intestinal conditions, hæmatemesis, and obesity. The highest medical authorities are quoted throughout. Whilst agreeing that sugar is an extremely valuable therapeutic agent, and that dextrose can be given intravenously whilst sucrose cannot, it is pertinent to ask whether dextrose by mouth really has any appreciable advantage over cane sugar. It certainly might puzzle many of us to distinguish between the condition of the well-to-do infant who is religiously given lactose in his formula, the middle-class one receiving dextrose, and the working-class baby whose bottle is made up with brown or white sugar, whichever happens to be on the table. The experiments of Mr. Sydney Cole, recorded in our present issue, suggest there may well be a more scientific basis for scepticism. The work of Ariyama and Tarhasi [1] on rats, however, indicates that the relative assimilation values of various sugars might differ profoundly; they obtained a value of 1·50 with pure maltose as compared with one of 0·76 with sucrose. Mr. Cole suggests that experiments might usefully be carried out by athletic students on the use of sugars. Dr. Donald Laird did make experiments two years ago somewhat on these lines.[2] He found that the fatigue-recovery value of maltose, as measured by strength of grip, agile dexterity, and speed of tapping, was almost invariably superior to that of sucrose. In any case, it is likely that dextrose will continue to enjoy a popularity both with doctors and patients far greater than that of table-sugar. The rivers of Damascus will always retain a higher reputation for spa treatment than the familiar Jordan.

PHARMACOLOGICAL RESEARCH

THE eighth annual report just issued of the laboratories of the Pharmaceutical Society of Great Britain, under the direction of Prof. J. H. Burn, M.D., contains this year an account of research work done in all departments of the college, except that of pharmacy which is in the process of reorganisation. On the chemical side, under Mr. W. H. Linnell, Ph.D., work continues on the relationships which exist between chemical constitution and physical activity. In the department of nutrition, under Miss K. H. Coward, D.Sc., something has been done to simplify the tests for vitamins and to determine the limits of accuracy in their biological estimation, but most of the time of the department has been occupied with routine testing and an interesting comparison has been made between the vitamin A and D content of the many samples of cod-liver oil submitted. A table is given of 24 samples examined for both these vitamins, from which it is seen that, expressed in international units per gramme, the A content varied from 500 to 8400, the D content from 50 to 360 units—the average of a larger sample examined for D alone being 157. Many oils with a high A yield had a low D yield, and vice versa. There is in fact no evidence that high vitamin-A potency is accompanied by high vitamin-D potency. In the department of pharmacology Prof. Burn continues the account given in previous reports of work on the pharmacological action of the tyramine which led unexpectedly to the demonstration of the existence in the dog of vasodilator fibres in the sympathetic nerves. The vasodilatation following electrical stimulation of sympathetic fibres, when an artificial circulation of blood is maintained, is increased when physostigmine is added to the blood, and abolished when atropine is added. These observations made it probable that the expansion of the blood-vessels when the sympathetic nerves were stimulated was due to the liberation of acetylcholine at the nerve-endings. Direct evidence in favour of this has been obtained by testing samples of blood withdrawn before and during stimulation of the nerves.

RADIOGRAPHICAL INNOVATIONS

THE actual production of a radiogram is a fairly rapid process, but plates and films take so long to dry that it has always been accepted as impossible for a radiological department to supply the finished product while the patient waits. In urgent cases reports are often made on wet films and these wet films are even sent round the hospital. This is a most unsatisfactory practice, since it implies not only inconvenience in the examination of films but also occasionally damage to or even loss of records. At a meeting of the British Institute of Radiology last week Dr. A. E. Barclay showed that, experimentally at any rate, both the washing and the drying of films can be greatly accelerated. He condemns the usual routine of washing films in a large tank as fundamentally wrong, since each film placed in the tank fouls all the water in the tank, and proposes as an alternative a cascade of small tanks each taking one film, through which water flows at a rate which ensures that all the water in each compartment is changed every half minute. This process not only involves considerable economy in water but chemical tests show that washing can be completed in three or four minutes. To expedite drying, the films can be passed through rubber rollers under very high pressure without damage and this gets rid of at least three-quarters of the water, that is usually left to evaporate. Experiments show moreover that the gelatine coat of the film will stand very great heat, provided that the air is moving rapidly; temperatures as high as 212° F. have been used without injury to the film. Dr. Barclay is convinced that the method of drying can be adapted to work on a large scale in hospital departments, and that in the future it should be

[1] Biochem. Zeitschr., 1929, ccxvi., 269.
[2] See THE LANCET, 1933, i., 868.

possible to give a photographic service which will produce the finished X ray film within half an hour of the time that it reaches the dark-room.

He showed also an apparatus for direct X ray cinematography recently built under a grant from the Medical Research Council. It is capable of handling 200 feet of X ray film five inches in width and of giving X ray pictures five inches square at the rate of eight a second. For most investigations to which it has so far been applied—i.e., of the slow movements of the large intestine, a much slower rate is used. The apparatus is extremely intricate, the technique however gives very much finer detail in thick parts than the indirect method of cinematography so successfully developed by Dr. Russell Reynolds and by Dr. Janker. Direct X ray cinematography has been attempted, with varying success, by Groedel of Bad Nauheim, L. G. Cole of New York, Jarre of Chicago, Alvarez of the Mayo Clinic, and others. Dr. Barclay considers that the technique described by him is only likely to be applicable for research purposes, but that it should be of definite value in the study of the mechanics of digestion. Indirect cinematography has, of course, the advantage of being quicker and less expensive. Dr. Russell Reynolds showed on Feb. 15th to the radiological section of the Royal Society of Medicine the improved results brought about by the use of large, sharp lenses, quicker emulsion, and better X ray tubes and screens. He illustrated, by a number of endless band films of joint movements, gastric peristalsis, and heart beats among other subjects, the potential value of the film for teaching purposes. The heart films with electrocardiographic indication were of special interest. The chief problem here is to counteract the interference of the static current caused by the rays. The result obtained with a cathode ray oscillograph, which records the heart beat by means of a spot below the film image, suggest that an accurate and informative tracing will be procurable before long.

DYNAMICS OF THE CEREBRO-SPINAL FLUID

THE more complete understanding of the dynamics of the cerebro-spinal fluid which has resulted from the recent work of L. H. Weed and others at Johns Hopkins [1] has been applied tentatively to the diagnosis and treatment of disease of the nervous system. In 1928 L. S. Kubie suggested the treatment of infections of the meninges and nervous parenchyma by "forced drainage" of cerebro-spinal fluid, and in 1933 he gave, along with G. M. Retan, a reasoned statement [2] of the value of this method of treatment. Briefly it consists of draining the subarachnoid space for a period of hours or days through a lumbar-puncture needle, at the same time giving the patient large quantities of water by mouth and of hypotonic saline intravenously. It is claimed that under these conditions the capillaries of the brain and spinal cord are filled to capacity and exude fluid which, passing down the perivascular channels, mixes with the fluid in the subarachnoid space. The antibodies of the blood can thus gain readier access to the nervous tissue and to the meninges. This treatment has been applied with encouraging effect, both with and without injections of antiserum, in the treatment of meningitis, poliomyelitis, encephalitis, and neurosyphilis. R. M. Fellows has now reported from the Meninger Clinic, Topeka, the successful treatment of gastric crises by this method in a case of tabo-paresis. The patient is nursed on a Bradford frame so that, after the lumbar puncture has been made, he may be turned on his back with the needle passing through a hole in the canvas support. It is left in position for 8 or 12 hours. In this time 200–300 c.cm. of fluid drains away, but the amount may be as much as 1½ litres if the tube is left in for 24 hours.

The dynamics of the cerebro-spinal fluid has also been investigated in relation to encephalography by T. J. C. von Storch at the Boston City Hospital. He finds [3] that the best encephalograms outlining the subarachnoid space over the entire surface of the brain may be obtained by draining the cerebro-spinal fluid completely and replacing it with air under a pressure similar to that present before the lumbar puncture. The technique used is somewhat complicated, but the results obtained are said to justify the extra apparatus. The method is rarely applicable to the diagnosis of intracranial tumours, but has been used in cases of localised epilepsy where there is reason to believe that the fits are due to meningeal adhesions.

"HOMEOSTASIS"

HOMEOSTASIS is the term proposed by Prof. W. B. Cannon of Harvard [4] to express the phenomenon of constancy of the internal environment, the importance of which for the animal organism was first pointed out by Claude Bernard. With the discovery of more and more methods by which the body regulates the composition of the blood and tissue fluids, a renewed interest in Claude Bernard's concept is noticeable among modern physiologists; a few months ago we had occasion to review a striking contribution to the subject by Prof. J. Barcroft.[5] Cannon's main interest lies in the autonomic nervous system, as one of the instruments through which adjustment is made, and he cites in particular the part which it plays in compensating for extremes of external temperature and external atmospheric pressure, excess of acid metabolites produced by severe muscular exercise, and loss of blood by hæmorrhage. The importance of the autonomic nervous system in this respect may be, and has been, deduced from a knowledge of the way in which it acts upon the blood-vessels, spleen, liver, and so forth, but it remained for Cannon and his school to make the final demonstration that animals whose spinal sympathetic system had been removed failed to react adequately, and rapidly succumbed under conditions in which the normal animal would have maintained physiological equilibrium. As the stress upon the normal organism is increased, a breaking point is ultimately reached; there are generally ample premonitory signs of this, and it might be possible to estimate the physiological reserve of individuals by measuring the strain to which they can be subjected without showing signs of breakdown. Owing to the objective nature of the mental symptoms which develop very early during oxygen-lack, diminution of atmospheric pressure is held to be a particularly suitable test to apply. Indeed it has for many years provided valuable information as to the fitness of prospective air pilots for their work. Another important point emphasised by Cannon is the poor reaction of the new-born infant to such conditions as cold, and he suggests that many of the apparently pathological states of infancy may be due to the overbearing of some undeveloped regulatory mechanism. A valuable field of research would indeed be a determination of the age at which various adaptive reactions become

[1] THE LANCET, 1933, ii., 32.
[2] Jour. Amer. Med. Assoc., 1933, ci., 354.
[3] New Eng. Jour. 1934, ccxl., 773.
[4] Amer. Jour. Med. Sci., 1935, clxxxix., 1.
[5] See THE LANCET, 1934, ii., 89.

effective. A salutary contrast to Cannon's optimistic attitude is manifest in a communication by Dr. Felix Boenheim, formerly of Berlin.[6] This paper provides incidentally a remarkable revelation of the conditions of starvation obtaining among the German unemployed during the years 1930–32; its purpose is to describe an investigation into the general condition and basal metabolic rate (B.M.R.) of emaciated individuals. These were adults of varying age, and few seem to have been above 5½ st. in weight. Although it is generally taken for granted that as body-weight decreases, the metabolic rate also decreases, Dr. Boenheim regards this as an adaptation to changed conditions which only occurs in "acute" fasts. When starvation has become chronic, as in his cases, he finds that many show a metabolic rate above the normal; only in a small minority is the rate diminished. He is inclined to interpret this as a grave sign, showing that the body has abandoned the attempt at compensation. Paradoxically, he regards the fact that protein food does not raise the basal metabolic rate as much as usual as a protective reaction. A paper by C. W. Baldridge, to which we have previously referred in THE LANCET,[7] may explain both findings, for it described experiments showing that while tissue destruction was in progress, the B.M.R. was raised. We attributed this to the "specific dynamic action" of the body proteins, and the destruction of tissue in these emaciated individuals might well have had the same effect. Administration of protein food would spare the tissue proteins and probably have very little additional specific dynamic action. This interpretation is supported by Dr. Boenheim's statement that the patients with raised metabolism continued to lose weight, and in many cases died shortly after he had seen them; the prognosis for those with a reduced B.M.R. was distinctly more favourable.

THE NEPHROTIC SYNDROME

THE so-called nephrotic syndrome, characterised by œdema, albuminuria, lowered plasma proteins, and no other signs of nephritis, continues to excite controversy. Prof. D. M. Lyon and Dr. D. M. Dunlop have recently recorded observations made on two fatal cases.[8] Both patients, at the beginning of their illness, exhibited all the criteria of true nephrosis, but the clinical picture in the course of months became changed to one without œdema and with rising blood pressure, and death occurred from uræmia. Post-mortem examination disclosed contracted kidneys in both patients. Lyon and Dunlop doubt the existence of nephrosis as a clinical entity distinct from the hydræmic stage of nephritis or postulate, alternatively, that such cases, if they escape intercurrent infection, progress to a state with secondary contracted kidneys. This suggestion is of course not a new one; the pathology of nephrosis has long been a matter of acute controversy. The argument here loses some force inasmuch as it rests on deductions from the study of two cases which may have come under observation largely because of their exceptional nature; in many cases life is prolonged for years without the fatal termination which makes post-mortem examination possible. No reference is made by Lyon and Dunlop to such observations as those of Fishberg, Holt and Howland, and Bennett, Dodds, and Baker, which point to somewhat different conclusions.

The latter part of the paper is concerned with the problem of the relation between the oncotic pressure of the serum proteins to œdema, studied largely on cases of chronic Bright's disease with renal œdema. Employing the formula of Govaerts, Lyon and Dunlop find that œdema is very rarely seen unless the oncotic pressure has fallen below 18 mm. of mercury, or the concentration of serum albumin has fallen below 2·5 g. per cent. They confirm the absence of exact correlation between fluctuation in the degree of œdema and the actual oncotic pressure of the serum proteins. The simultaneous study of the influence of sodium chloride in the control of œdema in these circumstances would be of interest, since much recent French work tends to show that this is the main factor regulating the clinical appearance or disappearance of œdema. Lyon and Dunlop have convinced themselves, from careful observation of the nitrogen balance on varying diets, that although high protein diets are unnecessary for the treatment of renal œdema, very low protein diets should be avoided whenever a massive albuminuria is present, and that no relationship can be established between protein intake in the diet and the quantity of protein excreted in the urine. In this connexion the work in Singapore of R. B. Hawes and E. C. Vardy[9] is of interest. Consideration of a large series of cases has led them to the conclusion that diet is of great importance in that foods tending to produce an alkaline urine prevent the progress and fatal termination of the disease. They believe that the addition of potassium salts to the diet is often of extreme value in controlling œdema and hypercholesterolæmia; they have even found that the albuminuria is often controlled at the same time. Their observations suggest that the sodium chloride factor emphasised by the followers of the school of Widal is of real importance, and that further knowledge concerning renal œdema must depend upon closer attention to the significance of this factor.

THE ONODI COLLECTION CATALOGUED

THE anatomy of the nose and its accessory cavities is so complicated and, at the same time, so variable that it was not thoroughly charted until long after the anatomy of other regions was intimately known. But in the closing years of the last century the clinical practice of rhinology made rapid advances and the necessity for its precise anatomical foundation became manifest. Prof. A. Onodi, director of the rhino-laryngological clinic in the University of Budapest, made a large series of dissections of this region, and his anatomical writings and specimens became famous throughout the world. Shortly after the war his collection was purchased from his son by a number of British laryngologists, with some subscriptions from others interested in the subject, and presented by them to the Royal College of Surgeons of England; other specimens have since been, and are being, added to fill in gaps. The usefulness of this unique collection has now been greatly increased by the catalogue[10] prepared by Mr. T. B. Layton, who has classified and described the specimens, and selected a number of them for illustration. The illustrations are from photographs by Mr. S. P. Steward and from drawings by Mr. S. A. Sewell,

[6] Act. Med. Scand., 1934, lxxxiv., 115.
[7] THE LANCET, 1934, ii., 1456.
[8] Edin. Med. Jour., February, 1935, p. 68.
[9] Quart. Jour. Med., 1935, iv., 1.
[10] Catalogue of the Onodi Collection in the Museum of the Royal College of Surgeons of England. By T. B. Layton, D.S.O., M.S. Lond., a Fellow of the College. Published, in conjunction with the Royal College of Surgeons, by the *Journal of Laryngology*. London: Headley Bros. 1934. Pp. 131. 10*s*.

and are beautifully reproduced and clearly described. The *Journal of Laryngology* has presented a copy of this valuable catalogue to every subscriber.

FAILURE IN BREAST-FEEDING

DESPITE all the infant welfare propaganda in this and other countries, the proportion of infants successfully breast-fed remains low. Dr. L. Schall's figures for Homburg indicate [1] that only 27·6 per cent. of babies in his private practice and 38·8 per cent. in his hospital practice were suckled for six months or longer. About a quarter in both groups were taken off the breast before the first month of life was completed. His experience could no doubt be paralleled in this country, and the hints on the management of breast-feeding contained in his address to medical practitioners may have their application here. Ignoring for the moment the well-recognised faults in the mother and faults in the child, repeated in every text-book, Dr. Schall goes straight to the real trouble in most instances—the relatives. The grandmother, the aunts, the neighbours, all with their terrifying stories of mastitis, starving infants, and poor-quality milk ; their fertile suggestions produce chaos in the mind of the young mother, still in bed, weak after her confinement, and completely without confidence in her own powers. Next in order of importance comes the maternity nurse, not so much because of any positive hindrance on her part to successful breast-feeding which she may present (although something might be said on this score), but because the doctor, not feeling quite at home on the details of lactation, is only too glad to leave such matters to the nurse, and as a consequence is only called in when difficulties have arisen. Dr. Schall's main plea is that doctors should take more interest in the physiological side of lactation. In his experience they are apt to drop into errors of three kinds : they mistake the engorged breast in the first week of lactation for mastitis ; they mistake the yellow colour often present during the change over from colostrum to milk for pus ; and they take the normal colour of the human milk to mean that it is too weak and watery. The cumulative effect of these three errors is to lead to quite unnecessary weanings. On the more usually recognised causes of failure in breast-feeding Dr. Schall has some observations to make. Even if hare-lip and/or cleft palate is present attempts at breast-feeding should be made ; the baby is often successful at emptying the breasts despite the deformity. A clear nasal air-way is of the first importance ; the commonest cause of blockage is a coryza which could generally have been prevented, e.g., by the affected person using a mask, and which can be relieved by local instillations and cleansing of the nostrils before feeds. For the baby who is unable to suck because of immaturity or because of the temporary effects of a difficult delivery, manual expression for a few days, with the expressed milk given by spoon, pipette, or bottle, will often lead on to successful breast-feeding later. The baby who screams at the breast or who is restless while feeding should have its mouth examined for sores and its abdomen for pyloric spasm or stenosis. It is, Dr. Schall says, almost certain to be the baby who is at fault and not—as is so apt to be supposed—the mother's milk. The depressed nipple may cause difficulty but Dr. Schall regards the nipple as of little importance for the act of what is erroneously called "sucking" ; a lusty baby will manage to extract milk from almost any anatomical variation of the mammary gland. Real absence of secretion is very rare, although the full establishment of lactation may be delayed beyond the usual fourth or fifth day ; in a small percentage the amount secreted daily remains inadequate for the full requirements of the baby. The chief factor however in establishing and maintaining adequate lactation is complete emptying of the breast by the baby. Dr. Schall deprecates too early resource to complementary feeding, lest the baby, finding the bottle easier, ceases to work at the breast.

[1] Münch. med. Woch., Jan. 17th, 1935, p. 83.

TYPES OF DEPRESSIVE PSYCHOSES

MOST psychiatrists recognise the unsettled nature of the categories with which they work and are reluctant to use for diagnostic or other clinical purposes any but wide general divisions. They are nevertheless forced to consider what salient features they can single out, more or less arbitrarily, to make subsidiary groups which will be accessible to more limited and precise inquiry. Sometimes the arbitrary and heuristic aspect of this method is not recognised. The artificial division of syndromes into those with hereditary ("constitutional") and those with environmental or understandable ("psychogenic") causation may even be put forward seriously as an essential matter of differential diagnosis. But where the purpose and limitations of the method are kept in view it can be profitable. In the wide range of the depressive disorders, subdivisions of this sort have been made from time to time : thus Hoch and Kirby described, and even tried to fix, the condition characterised by distressed perplexity. More recently Prof. Paul Schilder [1] has returned to the same topic. In a carelessly written but interesting article illustrated with seven detailed case-histories he first considers those cases in which bewilderment is prominent, along with guilt and fear and misery. Disregarding for the most part the important association between troubled perplexity and schizophrenic illness, he interprets the doubt which depressed patients may show as an expression of unfulfilled hatred ; it is the first step on the way to nihilistic ideas, denying the existence of the world. This speculation has less to support it than one which considers the difficulties the patient may have in adjusting his present self and state to that which has preceded it in experience. In the second part of his paper Prof. Schilder passes to depressive states accompanied by disorders of perception. The commonness of these is sometimes overlooked, and hallucinosis occurring otherwise than in an intoxication is often taken to be necessarily schizophrenic. Prof. Schilder's case records and his diagnostic comments on them, however, indicate how mistaken such an impression can be. In an attempt to account for these cases on psycho-analytic lines he lays great weight on the aggressive and destructive tendencies which occur in the condition, and holds their direction to be dependent on those earlier stages of development at which aggressive features may for the first time in childhood be conspicuous. Differences between various types of depression he would attribute to different points of arrest or attachment about these stages of development. Except in one or two points he does not depart here from the conventional psycho-analytic formulation, ingenious and scholastic, but his final opinion is more significant—viz., that we must consider "in what way the central personality organizes various partial drives." Although it is unlikely that by analysis of only the psychological

[1] Clinical Studies on Particular Types of Depressive Psychoses. By Paul Schilder. Jour. of Nerv. and Ment. Dis., 1934, lxxx., 501 and 658.

features of depression we shall come to any full understanding of this common disorder, profit may be expected from a study of the ways in which instinctual forces are at work in it and how they are fused together in its various forms.

A REMEDY FOR MYASTHENIA

LAST June Dr. Mary Walker, of St. Alfege's Hospital, described in our correspondence columns the remarkable effect of physostigmine upon a patient with myasthenia gravis. A fortnight ago she was able to show two cases to the clinical section of the Royal Society of Medicine which illustrated the relief of myasthenic symptoms by prostigmin, an analogue of physostigmine at present issued as a proprietary preparation. These cases aroused great interest, as well they might; for the relief obtained is unprecedented in this disease. In our present issue Dr. Blake Pritchard, with due acknowledgment to Dr. Walker's lead, records observations chiefly made at University College Hospital, upon seven cases of myasthenia gravis, all of which responded to treatment with prostigmin, given in conjunction with atropine. The response, unfortunately, is no more than transient; the recovery lasts but a few hours. Moreover, it has yet to be learnt whether frequent injection of the drug does more good than harm to sufferers from this disorder. On the other hand, if temporary, the recovery is nevertheless extraordinarily complete, and Dr. Pritchard's myograms suggest that it is physiological, not accidental. In other words, prostigmin seems to repair the mechanism damaged by the disease, and this finding should lead us nearer to an understanding of the cause of myasthenia gravis if not to its cure. If it is true—as seems probable—that stimuli are conveyed to muscles by the liberation of acetylcholine at the nerve-endings, then it is rational to suppose that in myasthenia there is some fault which prevents acetylcholine being formed in sufficient quantity or destroys it too rapidly. The fact that prostigmin can correct this fault—probably by delaying destruction of acetylcholine at the motor nerve-endings—is excellent evidence that the site of the trouble is the myoneural junction. What relation, if any, this bears to other observed changes, such as those in the thymus gland, is still unexplained.

MILK-BORNE EPIDEMICS

TYPHOID fever has been largely mastered in this country, but only at the price of eternal vigilance. It still looms large in America, where indeed it presents a definite problem, and those larger areas which are well organised keep regular records of all known typhoid carriers and endeavour to check and control their movements. Despite this many of the milk-borne epidemics are demonstrably due to carriers, a fact which is being brought home to the country by the work of the Dairy Research Bureau, whose recent bulletin gives particulars of the milk-borne epidemics reported in U.S.A. during the year 1933. They are summarised thus :—

	Epidemics.	Cases.	Deaths.
Typhoid fever	25	229	26
Paratyphoid fever	1	17	0
Diphtheria	2	19	3
Septic sore throat	7	515	5
Scarlet fever	3	238	4
Milk sickness	2	10	1
Udder cocci	2	250	0
	42	1278	39

Analysis of the 25 typhoid epidemics shows that 13 of them were due to infection from a typhoid carrier and a further three from cases of typhoid fever. The paratyphoid was spread from a case of this disease infecting the milk-supply. The epidemics of septic sore-throat were large and it is a fact of no little interest that such outbreaks are spread by milk year by year in America, while they occur rarely in Great Britain. Up to about 25 years ago one or two were reported in this country each year; outbreaks then ceased except for the extensive one at Brighton and Hove in 1930–31. This peculiarity of distribution has never been explained. Of the U.S.A. outbreaks the two most extensive were at Chilton (Wisconsin), with 1945 inhabitants and 250 cases, and at Luzerne and Hadley (New York State), still smaller villages with 179 cases; in each instance there were two deaths. One of the most extensive outbreaks in the series was in Cumberland County (Tennessee), where 248 cases were attributed to hæmolytic staphylococci in the udder of two cows. More particulars of this outbreak would be of interest. Apparently it was of acute food poisoning type due to the enterococcus toxin, thus linking it with other outbreaks of staphylococcus food poisoning. Two of the outbreaks, one of typhoid fever and one of milk poisoning, were spread by Grade A raw milk. In every instance the milk consumed was raw milk (in two cases cream) unpasteurised. This is linked up with the fact that in 30 of these 42 epidemics the population of the place was less than 10,000. Every student of public health in U.S.A. knows that the organisation in the large cities is usually at a high level, in the small towns and rural areas often rudimentary. Pasteurisation is almost universal in the cities, incomplete and partial outside them. Disease is spread by milk only in areas which do not enforce pasteurisation.

ON Feb. 28th and March 5th Dr. E. H. R. Harries will deliver the Milroy lectures at the Royal College of Physicians. He has chosen as his subject infection and its control in children's wards. The lectures will begin at 5 P.M.

CONGRESS OF INTERNATIONAL SOCIETY OF SURGERY. This society is to hold its tenth congress in Egypt from Dec. 30th, 1935, to Jan. 4th, 1936, the dates having been slightly altered from those previously announced. The main subjects of discussion will be the surgery of the parathyroids, the surgery of the lumbar sympathetic, the surgery of the colon (cancer excepted) and the surgical complications of bilharziasis. The congress begins with a reception by the municipality of Alexandria on Dec. 30th, and the members hold their first scientific session in Cairo on the following day. During the week there will be receptions by the president (Prof. A. von Eiselsberg, of Vienna) and by the president of council, and dinners by invitation of the Ministry of Public Instruction and by the Egyptian surgeons. It is hoped that there will also be a reception at the Royal Palace. Among those who are opening discussions are Prof. Archibald Young, and Prof. G. Grey Turner, the British delegate, who may be addressed at the British Post-Graduate Medical School, Ducane-road, Hammersmith, London, W.12. Prof. Grey Turner reminds potential members of the conference that many of the staff of the University of Cairo are British; furthermore a large proportion of the medical profession in Egypt have qualifications obtained in this country and nearly all speak English. Travel arrangements are in the hands of Messrs. Thos. Cook and Sons (head office: Berkeley-street, W.1.) who are prepared to issue itineraries and provide other information. The secretary-general is Dr. L. Mayer, 72, rue de la Loi, Brussels.

PROGNOSIS

A Series of Signed Articles contributed by invitation

XLI.—PROGNOSIS IN PREMATURITY

A PREMATURE infant is usually defined as one born before the fortieth week of pregnancy, but this obviously requires some amplification. Another definition depends upon the weight and length of the infant and accepts as premature any infant under 5½ lb. or 17 in. respectively. From the point of view of prognosis the latter more nearly approaches the ideal, for it conveys the conception of "immaturity." Actually a full-term baby may be "premature" in this sense and a small twin frequently resembles a premature baby in many ways. The maturity of development is the important point in a favourable prognosis, and it may be taken as a preliminary axiom that the more nearly the weight and length of a small new-born baby corresponds to the normal for the fœtal age the better the prognosis. Conversely, the greater the evidence of immaturity the worse the prognosis, and such evidence includes the presence of poor subcutaneous fat, a "stretched" parchment-like skin, low temperature, cyanotic attacks, feeble cry, and inability to suck. An estimate of the lowest possible limits at which survival is possible, while of theoretical interest, scarcely helps with the problem of the chances of the individual baby. It may, however, encourage the nursing staff on whose efforts the prognosis largely depends, to learn that the record in this country appears to be held by Dr. R. C. Jewesbury, with a baby weighing only 14 oz. Usually the lower limit must be taken as about 2 lb.; with a baby under this weight luck rather than skill turns the scale. At the other extremity any baby over 4 lb. ought to survive granted a favourable environment. From the point of view of the fœtal age, infants born before the end of the twenty-eighth week are generally regarded as non-viable, and, indeed, it is seldom that they survive.

Immediate Prognosis

The immediate prognosis of a premature baby can be discussed under the following headings.

THE BABY

Injuries at birth, the presence of congenital disease, attacks of respiratory failure and cyanosis, the existence of pulmonary atelectases (shown more frequently by scattered sharp crackles over the bases than by the traditional weak breath sounds), and the occurrence of excessive chilling, especially shortly after delivery, are all bad signs. The last mentioned is particularly important and special low-reading thermometers will reveal almost incredible examples of hypothermia in the first few hours of extra-uterine life, unless careful precautions are taken. The existence of evidence of immaturity of the skin has already been mentioned. Well-marked erythema is more likely to be present the more immature the infant, and the same is true of jaundice, so that to this extent both are unfavourable signs; this applies also to the presence of lanugo hairs and of sclerema. After the first few hours of life bad signs include inability to suck, excessive somnolence or excessive restlessness, and ceaseless crying. An occasional strong cry is of good omen, but in the second or third day of life restlessness, twitching, and vomiting all indicate excessive intracranial pressure, probably due to œdema, or in the worst cases to actual hæmorrhage. The occurrence of hæmorrhage in other situations (melæna neonatorum or hæmatemesis) is also of bad import. The development of œdema is fairly frequent and by itself does not appear to mean more than an instability of the chemistry of the tissues. A steady temperature at or about normal levels is a good point and so is a steady gain in weight. This latter is especially dependent upon the supply of nourishment available and comes more under the consideration of the state of the mother and the skill of the nurse. The prognosis as regards the baby may be summed up by saying that the longer it survives the better the prognosis as regards the final outcome.

THE MOTHER

Illness in the mother, especially when it is the cause of premature delivery, is of bad prognostic significance. Other things being equal the premature infant born after induction has a better chance than when the labour is brought on by some diseased condition. These include syphilis, nephritis, heart disease, pyelitis, tuberculosis, and any cause of high fever. Chronic alcoholism is sometimes a factor, but is not frequent nowadays. Where syphilis is the cause of the prematurity and the infant presents evidence of this disease at birth the outlook is very poor. These illnesses of the mother may also play an important part in determining the efficiency of lactation. From the point of view of the premature baby an adequate supply of human colostrum, followed by breast milk, is of great importance. In maternity institutions the latter is nearly always available, at any rate to keep the baby going for some days. In the private house, where the mother is the only source of supply, adequate massage and exhaustion of the breasts may compensate for the absence of an actively sucking baby. An electric breast pump (which can be hired) is even more effective in establishing lactation and maintaining a supply where the mother's illness does not preclude or interfere with the lactation process.

THE NURSE

It has been said that 95 per cent. of the credit for the survival of the premature baby belongs to the nurse (Hector). Certainly the promptness with which certain measures are adopted in the first few hours of life makes all the difference to the outlook of babies under 4 lb. Amongst these foremost place must be given to the avoidance of excessive chilling. The heat-regulating mechanism of a premature baby, like other bodily functions, is usually immature and inefficient. As already mentioned, thermometers designed to read below the usual limit of 95° F. will demonstrate temperatures much below this, and if such hypothermia is allowed to occur the outlook is ominous. Various devices have been advocated to prevent this. Bathing is undesirable and "dirt" can be safely left on for a few days. A complete gamgee covering and bonnet should be put on and the baby placed in a warmed cot. Several hot water bottles carefully applied and renewed frequently are necessary, but best of all is a small electric blanket. The Thermega pattern in use at Queen Charlotte's Hospital offers three ranges of temperature and is of the greatest value. The baby's temperature should be taken rectally at frequent intervals (every hour to begin with) and the "surrounding" temperature (bottles or blanket) adjusted to keep this steady at about 99° F. It is essential that the nurse should be completely healthy. A slight "common cold" in an attendant has sometimes meant the death of a premature baby

who would otherwise have survived, and to emphasise this danger it is advisable that those looking after the baby should wear masks to prevent any droplet infection. Finally, the skill of the nurse is of great importance in regard to feeding. A baby who cannot suck from a small teat will sometimes require the most careful feeding by spoon, pipette, or even œsophageal tube. Only great experience can ensure that nutrition is maintained by these means.

ENVIRONMENT

Premature chambers have gone out of fashion in this country, because of the difficulties, expense, and danger of infection. An ordinary cot or crib in a well-ventilated room is quite adequate so long as the baby's temperature is maintained as set out above. Means should be available to keep the room temperature at about 70° F., and of even greater importance is the maintenance of a definite degree of humidity. Dry air into which fluid is lost excessively on respiration adds greatly to the baby's difficulties. Special rooms into which air with a definite degree of moisture is pumped do not come into the realm of practical politics except in special institutions. A bowl of water should always be placed near any source of heat in the baby's room, and the use of a simple "damp detector" (such as is sold for use in travelling to detect damp in beds) will enable the nurse to ensure that the air is kept on the moist side of normal. The final point about the environment which affects the prognosis is once again the danger of infection. The more people who are near the baby the greater risk of this. Isolation should be practised as far as possible.

It will be realised from these remarks that the chances of survival of a premature baby depend mainly upon the greatest attention to detail. The full-time services of a nurse or nurses experienced in this kind of work are the dominant factors in success. During the first 24 hours these may not always be available, and yet it is especially at this period that the greatest danger lies.

Later Prognosis

Once past the first few weeks of life there are still several dangers ahead for the premature baby which must be briefly considered. Such babies are more liable to develop rickets and nutritional anæmia, probably because of deficient storage of vitamins and minerals owing to the shortened period of intra-uterine life. These disorders are easily prevented provided their danger is realised and the addition of vitamin D and iron to the diet should be begun early (not later than the third month even when breast-feeding is well-established). Dentition is frequently delayed and there is some evidence that dental caries is more likely to appear. Some authorities maintain that Little's disease and mental deficiency are more common among those children whose birth was premature than among the population generally, and certain statistics appear to bear this out. On the other hand, such accidents only happen to a very small proportion, and after 12 to 18 months a normal standard of nutrition and health is generally reached and maintained. There is no evidence for the popular belief that premature babies remain "delicate" all through life. Excessive maternal care is not infrequent, and a premature baby runs a special danger of being spoilt, but such behaviour problems are easily remedied if the danger is recognised.

ALAN MONCRIEFF, M.D., F.R.C.P.,

Physician to the Children's Department, Middlesex Hospital; Physician to Out-patients, Hospital for Sick Children, Great Ormond-street, and Assistant Pædiatrician, Queen Charlotte's Maternity Hospital.

THE SERVICES

ROYAL NAVAL VOLUNTEER RESERVE

N. A. Vernon and W. G. Gill entered as Proby. Surg. Lts., and R. R. Prewer entered as Proby. Surg. Sub.-Lt. and attached to list 2 of the London Div.

ROYAL ARMY MEDICAL CORPS

The War Office announces that Maj.-Gen. O. L. Robinson, C.B., C.M.G., will be the Representative Colonel Commandant of the Royal Army Medical Corps for 1935.

Lt.-Col. G. G. Collet retires on retd. pay.

Maj. H. N. Sealy to be Lt.-Col.

Capts. W. A. D. Drummond and J. G. E. Vachell to be Majs. (Provisional).

Capt. E. W. Gibbs resigns his commn.

Lts. to be Capts.—M. S. W. Bisdee, J. D. P. Macpherson, and R. W. Scott.

REGULAR ARMY RESERVE OF OFFICERS

Col. E. McDonnell, D.S.O. (late R.A.M.C.), having attained the age limit of liability to recall, ceases to belong to the Res. of Off.

TERRITORIAL ARMY

Col. H. F. Humphreys, O.B.E., M.C., vacates the appt. of A.D.M.S., 48th (S. Midland) Div.

Lt.-Col. R. A. Broderick, D.S.O., M.C., from R.A.M.C., to be Col., and is apptd. A.D.M.S., 48th (S. Midland) Div.

Capt. J. C. Gilroy to be Divl. Adjt., 48th (S. Midland) Div., vice Maj. G. G. B. Holroyd, M.C.

Capt. R. R. Leaning to be Divl. Adjt., 52nd (Lowland) Div. and Sch. of Instn., vice Maj. T. C. Bowie.

Maj. I. M. Pirrie, M.C., to be Lt.-Col.

Capt. N. G. Hill, M.C., to be Maj.

D. A. Beattie to be Capt.

TERRITORIAL ARMY RESERVE OF OFFICERS

Maj. C. B. Baxter, O.B.E., having attained the age limit, retires and retains his rank, with permission to wear the prescribed uniform.

ROYAL AIR FORCE

Flying Offs. A. W. Callaghan and I. Mackay to R.A.F. General Hospital, Hinaidi, Iraq.

Dental Branch.—Squadron Leader G. A. Ballantyne to R.A.F. General Hospital, Hinaidi, Iraq., for duty as Senior Dental Officer.

INDIAN MEDICAL SERVICE

The undermentioned retire: Lt.-Col. R. G. G. Croly, on account of ill-health, and Lt.-Col. F. C. Fraser.

DEATHS IN THE SERVICES

The death occurred on Feb. 3rd of Dr. Alfred Cropley at Chesham Bois, Bucks. He qualified L.S.A. Lond. in 1884 and M.R.C.S. Eng. in the following year, and joined the Royal Navy after passing a stiff examination with some honour. He was born at Swaton, Lincolnshire, and was educated at Doninton Grammar School, gaining the scholarship as head boy under Dr. Constable; and he afterwards proceeded to the London Hospital. He saw war service on *H.M.S. Calliope* at Samoa (Samoan Islands, near Fiji) in 1889 when difficulties arose regarding Samoa between Germany, Great Britain, and the United States and in the subsequent great storm when German and American war vessels were driven ashore at Apia in March, 1889, and about 150 were drowned the *Calliope* alone escaped by steaming out and the Captain was thanked by the Admiralty for his skill and seamanship. This was then picturesquely described officially by the Captain as "a terrible hurricane which caused disaster unprecedented since the introduction of steam." He was also on the *Iphigenia* (China) in 1897 as Staff Surgeon and became Fleet Surgeon in 1901 and at the end of the last war was amongst a little group of four retired Fleet Surgeons, all of the year 1901—namely, John Jenkins and John Lowney (who had been in the North American service) and William Edward Home, who had been in China and elsewhere. Dr. Cropley had also acted as assistant medical officer of health for the county borough of Huddersfield.

SPECIAL ARTICLES

IMMUNISATION EXPERIMENTS ON CALVES WITH B C G

BY A. STANLEY GRIFFITH, M.D., Ph.D.
MEMBER OF THE SCIENTIFIC STAFF, MEDICAL RESEARCH COUNCIL

J. BASIL BUXTON, M.A., F.R.C.V.S., D.V.H.
PROFESSOR OF ANIMAL PATHOLOGY IN THE UNIVERSITY OF CAMBRIDGE; AND

R. E. GLOVER, B.Sc., F.R.C.V.S.
INSTITUTE OF ANIMAL PATHOLOGY, CAMBRIDGE

Two reports of experiments at Cambridge on the immunisation of calves with B C G have been published. In the first series of experiments (Buxton and Griffith, 1931) the calves, which had been vaccinated by different methods, were tested as to their resistance to tuberculosis by intravenous injection of virulent bovine tubercle bacilli. In the second (Griffith, Buxton, and Glover, 1931) the vaccine was given intravenously and the test bacilli by the mouth. The first report included a brief summary of the results of immunity experiments with B C G in other countries.

REVIEW OF FOREIGN LITERATURE SINCE 1930

Cotton and Crawford (1932) have published the results of vaccinating cattle with B C G and exposing them subsequently to natural infection by close contact with adult tuberculous cows. Sixteen animals were used—8 vaccinated and 8 controls—and they were divided into three groups comprising: (1) animals born and maintained in a tuberculous environment, vaccinated subcutaneously at birth and yearly thereafter; (2) a similar group maintained as above but vaccinated at birth by the mouth; and (3) a group born and maintained under tubercle-free conditions, vaccinated by the mouth, and several months later placed in a tuberculous environment. The authors consider that taken as a whole the vaccinated animals differed little from the controls with respect to susceptibility to tuberculosis.

Rankin and his colleagues (1932) report a further series of experiments on the pathogenesis and vaccinating power of B C G. Groups of newly born calves from tubercle-free herds were given three doses of B C G (50 mg.) by the mouth on the third, fifth, and seventh days after birth. In the experiments in test of the virulence of B C G, 16 calves were allowed to run with an equal number of control calves of the same age. When slaughtered two years later the vaccinated and in-contact controls were all entirely free from tuberculosis, showing not only that B C G is harmless when administered by the mouth, but that passage of the organism through calves is incapable of leading to infection of in-contact, normal calves.

In the protection experiments the vaccinated and control groups were fed on tuberculous milk, and were also placed in contact with infected animals for a little more than six months. On post-mortem examination two years later the lesions in the controls (16) were not very extensive: six only were infected, one with organic lesions, four with glandular lesions, and one with microscopic lesions only. Of the 17 vaccinated animals 3 showed slight glandular involvement only. The experiment showed that 80 per cent. of the vaccinated animals were free from lesions, as compared with 60 per cent. in the controls.

Watson (1933) has also completed a series of experiments in which the immunity produced by the subcutaneous inoculation of B C G was tested by exposure to natural infection. The duration of exposure varied from a few months up to four and a half years. In a group of 44 vaccinated cattle and 28 unvaccinated controls, which died or were killed at periods ranging from two months to four and a half years, 9 (20·5 per cent.) of the vaccinated group and 6 (21·4 per cent.) of the controls were free from tuberculosis. In the remainder it was found that although there was little difference in the incidence of tuberculosis in the two groups taken as a whole, there was some evidence that in the vaccinated animals there was a greater degree of resistance up to two years, but that in periods of two years and over there was practically no difference in the extent of disease between the vaccinated group and the control animals.

Bang, Jundell, and Magnusson (1931) have given an account of a vaccination experiment in cattle with B C G. The animals were tested as to their resistance either by intravenous injection of culture of bovine bacilli or by exposure to natural infection. Of 9 controls, 4 died between five and six weeks of generalised tuberculosis and the remainder, on post-mortem examination, showed extensive lesions—i.e., an infection of 100 per cent. In the vaccinated group 54 per cent. were entirely free from macroscopic lesions, while in the remainder the lesions were usually less marked than in the controls.

Confirmation of the protective action of B C G has been obtained in the field (Jundell and Magnusson, 1933). The experiments were commenced in a large herd in 1927, a proportion of the calves being vaccinated at birth and revaccinated annually. The animals were segregated from the main herd until one to two years of age so that exposure to heavy natural infection was delayed until the second or third year. In 1931 autopsies on 36 vaccinated animals showed no lesions in 31 (86 per cent.), slight lesions in 4, and extensive lesions in 1, while in 39 non-vaccinated controls, 21 (54 per cent.) were free from infection, 11 had slight lesions, and 7 were extensively affected.

Brunzema and Kauffmann (1933) carried out a small experiment in calves. Six animals were immunised shortly after birth with large doses of B C G given by the mouth, and 12 months later were tested by feeding or by intratracheal injection with a virulent culture of tubercle bacilli. The result of the post-mortem examinations led the authors to the conclusion that B C G is capable of raising the resistance of calves to some extent against a not too severe infection by natural channels (mouth and trachea).

Apart from the precise experimental data furnished by these reports, the results of further field trials have been published from France, Italy, and Austria. Guérin (1933) summarises reports received from 203 veterinarians in France embracing a total number of 9244 cattle. All the reporters were unanimous in their opinion that the vaccine was perfectly innocuous, although many were of the opinion that, in practice, it was exceedingly difficult to carry through with strictness the hygienic measures which Calmette and Guérin consider indispensable. Nevertheless, even when these recommendations were not enforced, the use of the vaccine resulted in a progressive diminution in the extent of the disease in infected herds. Guérin emphasises the undesirability of vaccinating animals other than newly born calves, even though they may have passed a tuberculin test, on the grounds that in the bovine subject infected with a small dose of virulent tubercle bacilli, the pre-allergic state may be of long duration.

Gerlach (1931, 1932) states that several thousand animals have been injected with B C G from his institute without a single instance of progressive tuberculosis, thus proving the innocuousness of the culture. His own experiments on vaccination in calves have shown that once vaccinated with B C G they are refractory to a severe infection (strain Vallée). In the field more than 3000 animals have been vaccinated with excellent results and in many cases the animals have been revaccinated four or five times. In these herds, in which infection is often 50 per cent., many of the unvaccinated animals die of generalised tuberculosis while the vaccinated animals remain in good health.

Ascoli (1931) has also reaffirmed his belief in the innocuousness of B C G. He reports that in Italy more than 5000 cattle (including 1500 newly born calves) have

been vaccinated under strictly controlled conditions without apparent ill-effect.

The Present Investigation

As already stated we reported in 1931 the result of testing the immunity produced by the double intravenous method of injecting calves with B C G against virulent bacilli given by the mouth. The series comprised 6 vaccinated and 2 non-reacting animals. The vaccine was given twice, a dose of 10 mg. being followed three weeks later (four weeks in one calf) by 100 mg. Three months after the second dose of vaccine the resistance of the 8 calves was tested by pipetting into the mouth of each animal 5 mg. of a young culture of a fully virulent bovine strain. The control calves were killed 172 and 194 days respectively after the test dose, and showed moderately severe local and slight generalised tuberculosis. The vaccinated animals, killed after periods ranging from 173 to 204 days, were all free from macroscopic lesions, and emulsions of their glands failed to produce tuberculosis in guinea-pigs. The results showed that three months after vaccination all the treated calves were completely resistant to a dose of bovine bacilli by the mouth which caused moderately severe local and slight generalised tuberculosis in two normal calves.

Before one could form an opinion upon the probable practical utility of B C G under farm conditions it was essential to confirm the result of this preliminary experiment, and also to determine the duration of the immunity and whether it could be restored after its decline. We have been able with funds provided by the Ministry of Agriculture (Special Research Grant), Medical Research Council, and the Institute of Animal Pathology to make additional experiments in test of these questions, and in the following report we give an account of the results.

ANIMALS USED IN THE EXPERIMENTS

The total number of calves used in the new immunity experiments was 48, of which 29 (21 vaccinated and 8 controls) were assigned to the duration of immunity, and 19 (13 vaccinated and 6 controls) to the renewal of immunity experiments. Of the 48 calves, 34 were vaccinated intravenously, 31 twice (10 mg. followed three to four weeks later by 100 mg.) and 3 once (for dates, doses, and intervals between vaccination and resistance tests see Tables), and 14 served as controls.

The temperatures of the calves were taken for two or three days after each injection of vaccine. After the 10 mg. dose the temperatures of about a quarter of the calves remained normal, while those of the rest rose between the 24th and 32nd hour to from 104·2° F. to 106·8° F. In most of the calves the pyrexia had subsided by the second day, but in five was still high on the third day.

One calf did not recover and on the eighth day showed respiratory distress which gradually became more acute. The animal was slaughtered fourteen days after injection, and at the autopsy a pneumonic condition (red hepatisation) of the lung was found without any sign of prevaccination tuberculosis.

Another calf (121) was killed 25 days after injection because it also had had pneumonia and remained in poor condition. The autopsy showed a resolving tuberculous (B C G) pneumonia and a heavy fluke infestation of the liver. No prevaccination tuberculous lesions were found, and a guinea-pig injected with an emulsion of a bronchial gland did not develop tuberculosis; its inguinal glands, however, yielded cultures of B C G.

After the second intravenous injection of B C G the temperatures of nearly all the calves rose, many to 105° F. and over, the highest recorded being 107·2° F.; two or three showed acute respiratory distress.

One calf (159) died three days after the second injection. The autopsy showed the anterior and middle lobes solid, dark red, and of the consistency of liver, and the caudal lobes emphysematous and engorged with serous fluid, especially the interstitial tissues.

One calf (108) died of pneumonia nine days after the second injection. The animal was in poor condition and heavily infested with liver flukes.

Survival of B C G in the Tissues of the Calf after Intravenous Inoculation

In the course of the experiments as mentioned above three calves died or were killed when ill 9, 14, and 25 days respectively after intravenous injection of B C G. Their tissues were used for cultivation experiments, and B C G was recovered in culture from all the calves, the colonies being most numerous from the first and least in number from the last calf.

In order to determine the duration of the survival of B C G in bovine tissues, six calves were inoculated intravenously, each with 100 mg. of culture. The injections caused general malaise and pyrexia which lasted a few days and from which five of the calves made a good recovery.

The sixth calf was still ill on the third day and showed a considerable amount of respiratory distress. On the following day it was unable to rise and it died on the fifth day. The autopsy showed red hepatisation of the greater part of the lungs, the remainder being emphysematous, and moderate venous engorgement of the liver. In sections of the lung acid-fast bacilli were seen to be disseminated throughout the tissues, either singly within the epithelial cells or in clumps of from 6 to 20 elements; acid-fast bacilli were sparsely distributed in the liver and kidney tissues, but were not found in a bronchial, a mesenteric, or an internal iliac gland.

One of the five surviving calves was killed 71 days after injection.

No definite changes were seen on autopsy, but sections of the lung showed very slight thickening of the alveolar walls in a few places and scattered collections of endothelial cells mixed with leucocytes in the interalveolar tissue. No acid-fast bacilli were found microscopically. Cultures were made from several lymphatic glands (left bronchial, two mediastinal, a portal, a prescapular, and a popliteal), and from certain organs (the spleen and a kidney). Twenty-nine cultures were made on egg medium and incubated for two months. One colony of B C G only was obtained from the left bronchial gland.

A second calf was killed 120 days after injection. No acid-fast organisms were seen in sections of the lung, which had practically a normal appearance. Cultures from the left bronchial, a mediastinal, and a mesenteric gland remained sterile.

As viable organisms were very scanty on the 71st day and were not recovered 120 days after injection, it was decided to discontinue the experiment and to test the resistance of the remaining three calves to infection with virulent bovine bacilli by the mouth in the manner which is to be described. The results of the "survival" experiment indicated that B C G virtually disappears from the tissues of the calf before the fourth month after intravenous inoculation. It was therefore very interesting to find that despite this, two of the calves, seven to ten months after injection of B C G, resisted infection completely, and the third, thirteen months after vaccination, though it became infected, had a definitely higher degree of resistance than the control calves.

One must conclude either that resistance persists for some time after all the vaccinating bacilli have died, or that a few bacilli surviving somewhere in

the body—e.g., in lymphatic vessels as in goat 115 (Griffith, 1932)—suffice to maintain the capacity of the animal to resist infection.

Duration of Immunity

For this experiment 29 calves (21 vaccinated and 8 controls) were used. Of the 21 calves 18 had been vaccinated twice and 3 once. The calves were divided into four groups which were tested as to their resistance to tuberculosis 3, 6, 9, and 12 months respectively after vaccination. The test dose was 5 mg., except in the fourth series where it was 6 mg., of young cultures on egg of three or four different bovine strains suspended in salt solution given by pipette into the opened mouth of the animal.

THREE MONTHS GROUP

This series (Table I.) comprised 4 animals, of which 2 were vaccinated and 2 were controls. The 2 controls (147 and 148) were tested with tuberculin 12 days after the test dose of bovine bacilli and failed to react. Tested again on the 20th day they both gave clear-cut reactions. The calves were killed 83 and 165 days respectively after the resistance test.

TABLE I.—*Three Months Group. Resistance Test, May 26th, 1932*

No. of calf.	Dates of vaccination (1932).	B C G in mg.	Duration of life after test.	Post-mortem findings.
			Days.	
113	Feb. 5	10	K 88	No tuberculosis.
	,, 26	100		
114	,, 5	10	K 166	,, ,,
	,, 26	100		
147	Control.	—	K 83	Mod. T. of mesenteric and slight T. of two thoracic glands. One nodule in lungs
148	,,	—	K 165	Slight T. of pharyngeal and mesenteric glands.

T. = tuberculosis.

CALF 147.—Seven mesenteric glands, not enlarged, contained small caseous tubercles, up to 20, discrete and in small aggregations. In the right caudal lobe anteriorly there was a subpleural tuberculoma the size of a kidney bean; on section it was composed of firm grey tissue containing a few small soft caseous areas (T.B. scanty). The pleural fringes were definitely hypertrophied. The left bronchial and the long dorsal mediastinal gland contained a few caseous foci loosely aggregated.

The lung nodule in this calf was of unusual size, but as the calf did not react 12 days after the test dose one must assume that it was produced by the test bacilli, possibly by insufflation.

CALF 148 showed about 18 caseous, gritty tubercles in the pharyngeal glands and half a dozen calcareous and calcareo-caseous nodules up to a barley grain in the mesenteric glands corresponding to the middle two-fourths of the intestines.

The vaccinated calves were killed 88 and 166 days respectively after the test dose. No tuberculous lesions were found in either animal.

SIX MONTHS GROUP

This series (Table II.) comprised 7 calves—5 vaccinated (4 twice and 1 once) and 2 controls. The 2 controls (152 and 146) were tested with tuberculin 26 and 32 days after the test dose of bovine bacilli and both reacted.

CALF 152.—Killed 82 days. No fewer than 104 submucous parasitic nodules were counted in the intestines, but there were no tuberculous lesions. Of the mesenteric glands 17, widely distributed in the mesentery, contained caseous lesions varying in size from small foci or nodules, discrete or in aggregates up to masses 2 cm. in diameter; of the latter there were 8. Two ileocæcal glands were affected; one contained a patch of aggregated foci 1 cm. in diameter, the other discrete caseous tubercles. In the right middle lobe of the lung there was a subpleural nodule rather larger than a barley grain (T.B.). The visceral pleural fringes were slightly hypertrophied. The left bronchial gland contained an aggregate of caseous tubercles and three or four discrete foci. There were scattered caseous foci in a mid-mediastinal gland, and upwards of 24 caseous lesions up to a barley grain in size in the long mediastinal gland.

TABLE II.—*Six Months Group. Resistance Test, August 26th, 1932*

No. of calf.	Dates of vaccination (1932).	B C G in mg.	Duration of life after test.	Post-mortem findings.
			Days.	
115	Feb. 5	10	K 89	Slight T. mesenteric glands.
	Mar. 4	100		
116	Feb. 5	10	K 84	No tuberculosis.
	,, 26	100		
117	,, 5	10	K 166	,,
	,, 26	100		
118	,, 5	10	K 168	,,
	,, 29	100		
110	Jan. 26	100	K 87	,,
146	Control.	—	K 160	Mod. T. of glands of alimentary tract. Slight G.T.
152	,,	—	K 82	Mod. T. of glands of intestinal tract. Slight G.T.

CALF 146.—Killed 160 days. The intestines showed parasitic but no tuberculous nodules. Right submaxillary contained 7 or 8 caseous nodules up to a large pea. Both retropharyngeal glands were the size of goose-eggs and extensively replaced by caseous nodules and masses up to ½ in. in diameter. The mesenteric glands contained in all 10 nodules and 2 small aggregates (T.B.+). An ileocæcal gland contained an aggregate of tubercles 1 cm. in diameter. Lungs: two pea-sized caseating nodules were found in each cephalic lobe. The left bronchial and dorsal mediastinal glands were slightly enlarged and showed on section a moderate number of caseous nodules, about pea-sized, discrete and also aggregated (T.B.+).

The four twice-vaccinated calves were killed 84, 89, 166, and 168 days after the test dose, and the once-vaccinated calf at the 87th day. Four calves, including the latter, were entirely free from tuberculous lesions, while the fifth (115), killed at the 89th day, showed slight tuberculosis of five glands in the terminal portion of the mesentery. Each gland contained a calcareo-caseous nodule, the largest the size of a good-sized pea. One of these nodules showed microscopically numerous short tubercle bacilli, but cultures yielded relatively few (bovine) colonies, this result indicating that many of the bacilli were dead. Two guinea-pigs inoculated with mesenteric glands not showing lesions were free from tuberculosis 92 days' later.

NINE MONTHS GROUP

This series (Table III.) comprised 9 calves—7 vaccinated and 2 controls. Six of the vaccinated animals received two doses of B C G and one a single dose. The controls (167 and 165) were tested with tuberculin, one on the 21st and the other on the 32nd day after the resistance test dose, and both reacted.

CALF 167.—Killed 84 days. The intestines were free from macroscopic lesions. The mesenteric glands contained 8 caseating masses ranging from 1 to 2 cm. in greatest diameter. Three of these, together with a few scattered foci, were present in one gland in the middle of the mesentery. The others were widely distributed. One ileocæcal gland showed nearly the whole of the cortex firm and grey and beset with caseous foci. Another contained a small group of caseous foci. One colic gland contained a miliary

caseating tubercle. Other glands and all the organs were normal.

CALF 165.—Killed 163 days. The left submaxillary gland was enlarged and contained a mass the size of a chestnut composed of fibro-caseo-calcareous substance. The right post-pharyngeal gland contained a firm fibroid mass about ¾ in. in diameter beset with calcareo-caseous foci. The mesenteric glands contained about a dozen calcareo-caseous nodules or masses ranging from the size of a pea up to 2 cm. in greatest diameter. One ileocolic gland contained three similar areas rather less than 1 cm. One colic gland and a small gland on head of pancreas were calcareo-caseous. There was no sign of tuberculosis elsewhere.

TABLE III.—*Nine Months Group. Resistance Test, Nov. 29th, 1932*

No. of calf.	Dates of vaccination (1932).	B C G in mg.	Duration of life after test.	Post-mortem findings.
			Days.	
119	Feb. 5	10	K 85	No tuberculosis.
	,, 29	100		
120	,, 5	10	K 134	Slight retrogressive T. of mesenteric glands.
	,, 26	100		
122	,, 5	10	K 141	No tuberculosis.
	Mar. 4	100		
123	Feb. 5	10	K 164	,,
	,, 26	100		
124	,, 5	10	K 183	,,
	,, 26	100		
125	,, 5	10	K 184	One small nodule in a mesenteric gland.
	Mar. 4	100		
111	Jan. 26	100	K 162	No tuberculosis.
165	Control.	—	K 163	Mod. T. of glands of neck and mesentery.
167	,,	—	K 84	Mod. T. of mesenteric glands.

The six twice-vaccinated calves were killed 85, 134, 141, 164, 183, and 184 days respectively after the resistance test dose, and the once-vaccinated calf on the 162nd day. Five of these calves, including the last mentioned, were entirely free from macroscopic lesions of tuberculosis. One calf (120), killed 134 days after the resistance test, showed 18 caseo-calcareous lesions in the mesenteric glands, ranging in size from that of a millet-seed to an aggregate the size of a French bean. One ileocolic gland contained a millet-seed-sized tubercle. There were no lesions elsewhere. A guinea-pig was inoculated with an emulsion of the right bronchial gland, and was killed 113 days later; at the autopsy no tuberculous lesions were found. The remaining calf (125), killed 184 days after the resistance test, showed in a mid-mesenteric gland a hemp-seed-sized nodule with a fibrous wall and a calcareous centre.

TWELVE MONTHS GROUP

In this group (Table IV.) there were 9 calves, 2 controls and 7 vaccinated. Of the latter, 6 were vaccinated by the double intravenous method and 1 received a single dose of 100 mg. The test dose of bovine bacilli in this series was 6 mg. of bovine culture. The controls were tested with tuberculin twenty days after infection and both reacted.

CALF 168.—Killed 91 days. The left submaxillary gland contained a caseous tubercle the size of a millet-seed. The left retropharyngeal, three patches of aggregated tubercles, slightly gritty from calcification, up to 1 cm. in diameter. The mesenteric glands contained a dozen fairly evenly distributed caseating masses ranging from 1 cm. up to 2 × 1·5 cm. in diameter. One ileocæcal gland contained two masses up to 1 cm. and two ileocolic glands contained large caseating areas. No lesions elsewhere.

CALF 102.—Killed 175 days. The right pharyngeal gland, the size of a goose's egg, was extensively replaced by caseo-purulent collections ranging from a millet seed to a large pea surrounded by thin fibrous capsules; gritty foci were detectable in pus. Left pharyngeal, slightly enlarged, showed more than half the cortex replaced by similar nodules. The mesenteric glands contained 15 lesions, either single tubercles, aggregations of tubercles or caseous and softened areas, up to a kidney bean in size. One ileocolic gland was beset with caseous gritty tubercles. The colic gland contained scattered caseous tubercles. The lungs contained 4 small nodules, 3 with caseous gritty centres (T.B.+). Left bronchial and one mediastinal gland contained gritty caseous nodules, not numerous. Liver contained one hemp-seed-sized grey nodule (T.B.+).

TABLE IV.—*Twelve Months Group. Resistance Test, March 9th, 1933*

No. of calf.	Dates of vaccination (1932).	B C G in mg.	Duration of life after test.	Post-mortem findings.
			Days.	
136	Feb. 8	10	K 92	One nod. ileocæcal gland.
	,, 29	100		
137	,, 8	10	K 117	Three nods. in mes. glands.
	Mar. 4	100		
138	Feb. 8	10	K 124	One nod. in a submax. gland.
	Mar. 4	100		
141	Feb. 8	10	K 180	Scattered nods. mes. glands.
	,, 29	100		
139	,, 8	10	K 188	No tuberculosis.
	,, 29	100		
140	,, 8	10	K 189	Scattered nods. mes. glands.
	Mar. 5	100		
112	Jan. 26	100	K 126	Slight T. of 3 mes. glands.
168	Control.	—	K 91	Moderate T. glands of alimentary tract.
102	,,	—	K 175	Fairly extensive T. glands of alimentary tract; slight G.T.

nod. = nodule.

The six calves vaccinated by the double method were killed 92, 117, 124, 180, 188, and 189 days respectively, and the once-vaccinated calf (112) on the 126th day after the test dose. With the exception of calf 139, which was entirely free from macroscopic lesions, all the vaccinated calves showed tuberculosis varying in degree but of less extent in all than in either of the controls.

CALF 136.—Killed 92 days, showed a caseous nodule (3 mm.) in an ileocæcal gland. Sections of the nodule showed areas of necrosis, giant cells, and a few tubercle bacilli.

CALF 137.—Killed 117 days, showed in the mesenteric glands 3 caseo-purulent encapsulated nodules ranging from 6 to 10 mm. (T.B. not numerous). Cultures of bovine bacilli were obtained from one nodule.

CALF 138.—Killed 124 days, showed one hemp-seed-sized caseous nodule with a fibrous wall in a submaxillary gland (T.B.+).

CALF 112.—Killed 126 days, showed slight tuberculosis of three terminal mesenteric glands, one containing a small gritty tubercle and two each a small area in which were minute yellow foci.

CALF 141.—Killed 180 days, mesenteric glands contained 8 fairly evenly distributed caseo-calcareous nodules up to 1 cm., and here and there a few caseo-calcareous tubercles. One ileocæcal gland contained a large pea-sized caseo-calcareous nodule.

CALF 140.—Killed 188 days, mesenteric glands showed 5 widely distributed caseous softened encapsulated nodules ranging from about 0·5 to 1 cm. in diameter. An ileocæcal gland contained 2 caseous hemp-seed-sized nodules.

SUMMARY OF DURATION OF IMMUNITY EXPERIMENTS

Eighteen calves were vaccinated by the double intravenous method, each animal receiving 10 mg. and 100 mg. of B C G with an interval of 21 to 25 days between the doses. In addition there were three calves which received a single intravenous inoculation of 100 mg. of B C G. The calves were tested in batches at intervals of three, six, nine, and

twelve months after vaccination, together with 2 controls to each group, by the oral administration of virulent bovine tubercle bacilli.

Control calves.—The control calves, eight in number, were killed after periods ranging from 82 to 175 days. All showed evidence of moderate progressive tuberculosis, the extent of infection varying with the period elapsing from the administration of the test dose and the time of autopsy. In every calf caseous or caseo-calcareous lesions were found in the mesenteric glands, and in most instances in the cæcocolic glands also. With the exception of three animals (147, 152, and 167), caseous lesions varying from a millet-seed up to aggregates the size of a runner bean were found in the glands of the head and neck. Evidence of dissemination was found in three calves (102, 146, and 152) in the form of early lesions in the mediastinal or bronchial glands and one or two foci in the lungs; in addition, calf 102 showed a lesion in a portal gland.

Vaccinated calves.—There was a progressive decrease in the proportion of the vaccinated calves which resisted infection in the different groups.

Three months after vaccination.—The two vaccinated calves were free from tuberculosis 88 and 166 days after the test dose. The results were in conformity with the 1931 experiment, the calves appearing to be immune.

Six months after vaccination.—The five vaccinated calves were killed after periods ranging from 84 to 168 days. Four calves, three of which were twice and one once vaccinated, were quite free from macroscopic lesions. The remaining animal (115) showed slight caseo-calcareous lesions in the mesenteric glands.

Nine months after vaccination.—The seven vaccinated calves were killed after periods ranging from 85 to 184 days. Five calves, including one once vaccinated, showed no evidence of tuberculosis. The two remaining calves showed isolated caseo-calcareous lesions in the mesenteric glands only; they were less extensive than in the controls.

Twelve months after vaccination.—The seven vaccinated calves were killed after periods ranging from 92 to 189 days after the test dose. Only one animal was free from macroscopic lesions. The remainder showed very slight or moderate infection of the glands of the alimentary tract. In two calves one gland only was affected, while in the rest the lesions were less extensive than in the controls.

Experiments on Renewal of Immunity

The previous series of experiments showed that the immunity produced by intravenous inoculation of B C G was, under the conditions of the experiment, complete three months and almost complete six months after vaccination. Subsequently the proportion of completely resistant animals diminished progressively, and at the twelfth month only one calf was still immune, though the resistance of the remainder was higher than the normal.

With the object of ascertaining whether immunity which had waned could be restored and possibly increased by a further injection of B C G, three batches of calves were revaccinated with a single dose of 100 mg. of B C G six, nine, and twelve months respectively after an initial double inoculation with B C G.

FIRST SERIES

Five calves which had been vaccinated by the double intravenous method were six months later each given a single intravenous injection of 100 mg. B C G (Table V.). Six months after revaccination the five calves together with two controls received by pipetting into the mouth 10 mg. each of mixed bovine strains. The controls (171 and 166) were tuberculin-tested one month later and both reacted.

CALF 171.—Killed 84 days. The right tonsil contained a yellow focus histologically tuberculous. The right pharyngeal gland was considerably enlarged and closely beset with caseous nodules up to a barley grain. The left gland contained about two dozen similar caseous nodules. The mesenteric glands corresponding to the jejunum and ileum contained altogether about 26 caseous foci, singly and a few in aggregates, and two pea-sized nodules. Ileo-cæcal and colic glands contained 4 caseous tubercles. There was no disease elsewhere.

TABLE V.—*Six Months Revaccination. Resistance Test Oct. 12th, 1933*

No. of calf.	Dates of first vaccination (1932).	B C G in mg.	Re-vaccination (1933).	B C G in mg.	Duration of life after test.	Post-mortem findings.
					Days.	
160	Sept. 1	10	April 5	100	K 96	No tuberculosis.
	,, 24	100				
161	,, 1	10	,, 7	100	K 153	,,
	,, 24	100				
162	,, 1	10	,, 7	100	K 89	,,
	,, 27	100				
163	,, 1	10	,, 7	100	K 166	Slight T. mes. glands.
	,, 27	100				
164	,, 1	10	,, 7	100	K 165	One nod. mes. gland.
	,, 27	100				
171	Control.	—	—	—	K 84	Mod. T. of alimentary tract
166	,,	—	—	—	K 158	Fairly severe T. of glands of alimentary tract. Slight G.T.

CALF 166.—Killed 158 days. Tonsils normal. Right submaxillary gland, 3 small calcareo-caseous tubercles. Other neck glands normal. Mesenteric glands were moderately severely affected and contained in all 56 separate lesions ranging from a millet-seed up to large caseating gritty areas. The ileocolic and colic glands were all affected in some degree, containing lesions ranging from a small nodule to areas replacing much of the gland substance. Two gastric glands were tuberculous. Lungs: the left caudal lobe showed under the dorsal pleura a nodule the size of a damson composed of softened caseous collections surrounded by fibrous walls. Left bronchial contained a caseo-calcareous nodule (1 cm.) and miliary gritty caseous tubercles clustered mainly around the nodule. The long mediastinal gland contained 2 tubercles up to a wheat grain. Liver showed a subcapsular pea-sized nodule with soft centre and fibrous wall. A portal gland and three pancreatic glands contained one or two tubercles.

The vaccinated calves were killed at periods varying from 89 to 166 days after the test dose. Three of the calves were entirely free from macroscopic lesions of tuberculosis; of the two remaining, one showed a single pea-sized caseous lesion in a mesenteric gland, and the other a dozen caseous, softened, encapsulated nodules ranging in size from a hemp-seed to that of a kidney bean in the mesenteric glands.

SECOND SERIES

Four calves which had been vaccinated by the double intravenous method were each given nine months later a single injection of 100 mg. of B C G (Table VI.). Six months after revaccination the 4 calves, together with 2 controls, each received by the mouth 10 mg. of mixed cultures of bovine strains. The controls (169 and 103) were tested with tuberculin 19 and 30 days respectively and both reacted.

CALF 169.—Killed 103 days. The left pharyngeal gland was slightly enlarged and showed 18 miliary caseous tubercles, while the right gland contained only one. The mesenteric glands were moderately severely affected and contained 16 caseating nodules ranging in size from a pea to a bean. Three cæcocolic glands were affected—two extensively—while two colic glands showed large caseating foci. There were no lesions elsewhere. A guinea-pig inoculated with left bronchial gland was killed

108 days later and was free from tuberculosis; cultures from both groups of inguinal glands of the guinea-pig remained sterile.

CALF 103.—Killed 119 days. Both retropharyngeal glands were much enlarged and almost entirely composed of a dense pinkish tuberculous tissue, moderately closely beset with caseous areas up to a barley grain. In the mesenteric glands there were ten nodules, dense and caseating, ranging from a hemp-seed to a bean. One ileocæcal and one colic gland were affected. No lesions elsewhere.

TABLE VI.—*Nine Months Revaccination. Resistance Test June 15th*, 1933

No. of calf.	Dates of first vaccination (1932).	B C G in mg.	Revaccination (1932).	B C G in mg.	Duration of life after test.	Post-mortem findings.
					Days.	
126	Feb. 5 Mar. 4	10 100	Dec. 3	100	K 109	Slight T. of retropharyngeal glands only.
127	Feb. 5 ,, 29	10 100	Dec. 3	100	K 105	No tuberculosis.
129	,, 5 Mar. 4	10 100	,, 6	100	K 113	,,
130	Feb. 5 ,, 29	10 100	,, 6	100	K 121	,,
169	Control.	—	—	—	K 103	Moderate T. confined to glands of alimentary tract
103	,,	—	—	—	K 119	Ditto.

The four vaccinated calves were killed between the 105th and 121st day. Calf 126 showed in the left pharyngeal gland a large pea-sized lesion with a thick fibrous wall and caseo-purulent contents (T.B.+), and in the right pharyngeal there was a fibrous nodule the size of a hemp-seed. The three remaining calves were entirely free from macroscopic lesions.

THIRD SERIES

Four calves which had been vaccinated by the double intravenous method were revaccinated 12 months later by the intravenous inoculation of 100 mg. of B C G (Table VII.). Six months after revaccination the four calves, together with two controls, were fed with about 10 mg. each of cultures of virulent bovine strains. The controls (101 and 170) were tested with tuberculin on the 24th and 39th days respectively after feeding and both reacted.

CALF 101.—Killed 89 days. The right pharyngeal gland showed a moderate number of aggregated tubercles. The left gland contained a bean-sized area beset with caseous foci. The mesenteric glands showed about three dozen caseous or caseo-calcareous lesions varying in size from a pin-point to 2 cm. in diameter. They were scanty in the anterior glands, but became progressively more numerous towards the ileocæcal valve. Six of the ileo-cæco-colic glands were affected, four containing each a single focus, one four nodules, and one a large caseous mass the size of a hen's egg. The right bronchial gland contained two caseous foci and the left a moderate number of aggregated caseous tubercles (yielded cultures of bovine T.B.). The mediastinal glands were moderately affected with caseous centres. One grey miliary tubercle was seen in the lungs.

CALF 170.—Killed 145 days. The left tonsil contained a millet-seed caseous tubercle. Both pharyngeal glands were enlarged to about three times the normal and were closely beset with caseous, slightly gritty, encapsulated nodules. The mesenteric glands contained about two dozen lesions distributed throughout the glands, varying from a single nodule to groups from 0·5 cm. to 1·5 cm. in diameter. One colic gland contained a small focus. Lungs: under the pleura of the right lung a grey focus, millet-seed in size, with a small yellow centre.

The vaccinated calves were killed after periods ranging from 91 to 153 days. Two were entirely free from tuberculosis. One showed four encapsulated caseous lesions in the mesenteric glands, ranging from a hemp-seed to aggregates of 0·5 cm. in size. In the remaining one the mesenteric glands contained irregular caseous lesions ranging in size from a mass 0·5 cm. by 1·5 cm. down to pin-points. In all there were about 36 lesions distributed throughout the glands. Of the ileo cæco-colic group of glands three were affected, one containing a bean-like caseous nodule and the others smaller scattered foci, similar in extent to those seen in the control calf (101) but less advanced.

TABLE VII.—*Twelve Months Revaccination. Resistance Test Sept. 15th*, 1933

No. of calf.	Dates of first vaccination (1932).	B C G in mg.	Revaccination (1933).	B C G in mg.	Duration of life after test.	Post-mortem findings.
					Days.	
133	Feb. 8 Mar. 4	10 100	Mar. 7	100	K 146	No tuberculosis.
134	Feb. 8 ,, 29	10 100	,, 7	100	K 91	Four encapsulated lesions in mes. glands.
135	,, 8 Mar. 4	10 100	,, 7	100	K 153	Moderate T. of mes. glands.
144	Feb. 8 ,, 29	10 100	,, 10	100	K 94	No tuberculosis.
101	Control.	—	—	—	K 89	Fairly severe T. of glands of alimentary tract. Slight G.T.
170	,,	—	—	—	K 145	Moderately severe T. of glands of alimentary tract and very slight G.T.

SUMMARY OF THE THREE SERIES OF REVACCINATION EXPERIMENTS

Thirteen calves were vaccinated by the double intravenous method. They were divided into three groups of five, four, and four calves, and were revaccinated intravenously with a single dose of 100 mg. of B C G at intervals of six, nine, and twelve months respectively after the first protective injections. The resistance of the calves was tested six months after the last dose of vaccine by the oral administration of virulent bovine bacilli. Two unvaccinated calves in each group received equivalent amounts of bovine culture and served as controls.

The six *control* calves killed 84 to 158 days after the test dose all showed moderate tuberculosis of the glands of the alimentary tract, and in two the disease was slightly generalised.

The *vaccinated* gave the following results:—

Six months revaccinated.—Killed 84 to 166 days. Of the 5 calves, 3 showed no lesions, 1 a single pea-sized lesion in a mesenteric gland, and the remaining 1 a dozen caseous encapsulated nodules in the mesenteric glands.

Nine months revaccinated.—Killed 105 to 121 days. Of the 4 calves, 3 showed no lesions, and 1 showed two small retrogressive lesions in the pharyngeal glands.

Twelve months revaccinated.—Killed 91 to 153 days. Of the 4 calves, 2 were free from lesions; 1 showed 4 encapsulated caseous lesions in the mesenteric glands; and 1 showed moderate tuberculosis of the mesenteric and ileocolic glands without generalisation. (The disease in the controls was generalised.)

Of the 13 revaccinated calves therefore, 8 remained free, 4 showed from 1 to 12 encapsulated lesions,

and 1 a moderate degree of tuberculosis, but less than the controls.

Conclusions

Duration of immunity.—Complete immunity against tuberculous infection by the mouth can be conferred on calves by the intravenous inoculation of B C G. The immunity lasts a variable time. Under the conditions of our experiments the duration of absolute immunity ranged from nearly six months up to more than a year. It may be suggested that a state of relative immunity would have existed for much longer periods, since the calves which became infected in the later stages of the experiment showed disease of less extent and greater chronicity than the controls.

Immunity after revaccination.—Revaccination with 100 mg. B C G restored the immunity but the protection was complete in a smaller proportion of calves than after primary vaccination. When compared with calves receiving a single course of B C G which were tested at the same period after vaccination (six months) the results appear to indicate that revaccination does not give as good an immunity as primary vaccination, but the numbers of calves are too small for definite conclusions on that point.

REFERENCES

Ascoli, A.: Ann. de l'Inst. Pasteur, 1931, xlvii., 29.
Bang, O., Jundell, I., and Magnusson, H.: Ibid., 1931, xlvii., 306.
Brunzema and Kauffmann: Zeits. f. Hyg. u. Infekt., 1933, cxv., 370.
Buxton, J. B., and Griffith, A. S.: THE LANCET, 1931, i., 393.
Cotton, W. E., and Crawford, A. B.: Jour. Amer. Vet. Med. Assoc., 1932, lxxx., 18.
Gerlach, F.: Ann. de l'Inst. Pasteur, 1931, xlvii., 475; Wien. tierartz. Woch., 1932, xiv., 353.
Griffith, A. S., Buxton, J. B., and Glover, R. E.: 2nd Rept. Direct. Inst. Anim. Path. Univ. Camb., Cambridge, 1931, p. 46.
Griffith, A. S.: THE LANCET, 1932, i., 303.
Guérin, C.: Réc. Méd. vét., 1933, cix., 5.
Jundell and Magnusson (1933): Abstr. in Vet. Bull., 1934, iv., 413.
Rankin, A. C., Ower, J. J., Shaw, R. M., Talbot, P. R., and Vango, H. M.: Canad. Jour. Res., 1932, vi., 177.
Watson, E. A.: Ibid., 1933, ix., 128.

THE STATUS OF MIDWIVES

SCHEME FOR AN ORGANISED SERVICE

JUST over a year ago the National Birthday Trust Fund appointed a Joint Council of Midwifery consisting of representatives of the principal organisations interested in public health, maternal mortality, and the professional status of midwives.[1] Shortly after its establishment this council formed the opinion that "further consideration of the whole question of the remuneration of midwives, as bearing on the efficiency of the midwifery service, is urgently required, and that a detailed scheme should be prepared for the enlistment of midwives throughout the country in an organised service, suited to the needs of each district, and having due regard to the retention of the mother's freedom of choice of attendant." A midwifery service committee, under the chairmanship of Dr. T. Watts Eden, was appointed to draw up such a scheme. The report of this committee now to hand has been adopted by the council and presented to the Minister of Health. Therein the position and prospects of the midwife are reviewed at length with full consideration of results of previous inquiries and possible changes in customs and conditions of childbirth.

On the question of hospitalisation the committee hold conservative views. They believe that where home conditions are suitable, normal confinements can satisfactorily be conducted there and that no decrease in maternal mortality will be produced by increasing the number of beds available for normal cases in hospital. They are also agreed that every maternity case should be conducted by a qualified midwife and that unqualified attendants should be forbidden, even under the supervision of a medical practitioner. Further, they hold that the local authority should undertake the duty of providing midwives for patients who have engaged doctors and cannot afford a trained nurse.

PROPOSALS FOR RAISING THE STATUS OF MIDWIVES

The report makes clear that the financial position of the midwife to-day is an increasingly bad one; her average earnings are estimated at £80 a year, and in some areas are as low as £50. (The midwives in practice who take less than 15 cases per annum are not included in this estimated average.) There is evidence also that the low level of comfort and cleanliness in the dwellings of midwives in some areas militates against a high professional standard. The great majority of patients pay no more than 30*s.* for the services of a midwife. The committee think that the chief causes of this low remuneration are the economic position of those who principally employ midwives, the fact that many midwives practise their profession part time or occasionally, and the excessive number of midwives—which results from the shortness of the present training period and low educational standard required.

The committee have carefully considered three different methods of remedying the situation: (1) restriction of the numbers in practice; (2) increase in the remuneration; and (3) establishment of an organised service under the local authorities.

1. *Restriction of numbers* might possibly be achieved by any one of the four following methods:—

(*a*) By a panel system based upon National Health Insurance contributions, and worked on the same lines as the medical panel.

(*b*) By a panel system organised by the local authority; the panel to be formed by selecting suitable midwives and allotting all necessitous cases to them, payment being guaranteed by the local authority.

(*c*) By restriction of the numbers allowed to practise in any given area by legal enactment—for example, by the introduction of a system of licensing.

(*d*) By restriction of entrants to the profession: (i) organised by a professional organisation; (ii) by legal enactment; (iii) by raising the standard of the examination for the certificate of the Central Midwives Board to such a high level that only a small percentage of candidates would succeed in obtaining the certificate.

The objection to (*a*) is that women might not care to select a midwife, in the way that patients select a doctor, before they have any reason to anticipate a need for her services, and that the only practical method of paying a capitation fee would be out of the National Health Insurance Fund, no doubt involving an increase in the weekly contributions

[1] The personnel of the council is: the Earl of ATHLONE (chairman); Lord ABERDARE and * Sir FRANCIS FREMANTLE (vice-chairmen); * Dr. T. WATTS EDEN, * Dr. J. S. FAIRBAIRN, and Mr. L. C. RIVETT (*British College of Obstetricians and Gynæcologists*); Dame LOUISE MCILROY, * Mr. E. W. G. MASTERMAN, and * Mr. W. H. F. OXLEY (*British Medical Association*); * Dr. J. J. BUCHAN (*Society of Medical Officers of Health*); * Dr. R. D. SMEDLEY (*Association of County Medical Officers of Health*); * Miss WOOLDRIDGE and * Miss M. COLEMAN (*Association of Inspectors of Midwives*); Mr. R. H. P. ORDE (*British Hospitals Association*); * Miss E. M. DOUBLEDAY (*College of Nursing*); * Miss E. M. PYE, * Miss BURNSIDE, and * Miss G. B. CARTER (*Midwives Institute*); Sir JULIEN CAHN, * Mrs. STANLEY BALDWIN, and * Lady WILLIAMS (*National Birthday Trust Fund*); Sir WILLIAM HALE-WHITE, * Mrs. BRUCE RICHMOND, and Miss M. WILMSHURST (*Queen's Institute of District Nursing*); * Mr. RHYS DAVIES, * Miss MEGAN LLOYD GEORGE, * Major ELTON LONGMORE, * Mr. J. M. NEWNHAM, and Lord STRATHCONA (*Independent Members*). Asterisks indicate members of midwifery services committee.

The objection to (*b*) is that there would be injustice to midwives not selected for inclusion in the panel; and to (*c*) that an undesirable principle of divided responsibility would be introduced if some of the control at present vested in the Central Midwives Board were given to the local supervising authority. As to (*d*) a limitation of the number of new midwifery certificates issued would have little effect on the present congestion. Any one of the 52,872 midwives already on the roll might at any time notify her intention to practise. Before there could be any fixed limit for the number of entrants there would have to be a careful survey of the needs of the population and the rate of wastage through such factors as death, marriage, emigration, and sickness. This practice is followed in Denmark, but the service there is centralised and controlled.

2. *Increasing Remuneration.*—Various reports give differing estimates as to the number of cases a midwife can take annually if she is to maintain a high professional standard of work. On the basis of 100 cases annually, with an average fee of 30*s*., she would still earn only £150 gross, from which all her expenses have to be deducted.

The remuneration of midwives might be increased through their whole-time employment by a voluntary or provident association at a salary. In rural areas this is now largely the practice. Queen's nurse midwives get from £68 to £80 a year with full cost of board, lodging, uniform, light, and attendance, which can be paid to the nurse as an inclusive salary, and their superannuation is provided for. Village nurse-midwives (not general-trained) receive an initial inclusive salary of £110, rising to £130 or more. The fees paid by patients are usually about 21*s*. to 25*s*. and the voluntary subscriptions to the associations make up the balance. This system works with great success in many county areas, but only a small proportion of the midwifery in urban or industrial areas is carried on by midwives in the employ of nursing associations.

A second method would be to pay the midwives direct the whole or part of an approved fee for each case she attended, the money to come either from a voluntary or provident association or from the local authority, or out of maternity benefits. The carrying out of this suggestion raises great difficulties, as the patient has a statutory right to the benefit money and would resent its diversion, even though in fact if she received it she might give it all or part in payment of the midwife's fee. It would also leave unsolved the problem of the uninsured patient. The flat subsidy rate would also perpetuate the present system by which women regard the practice of midwifery as an adjunct to family resources rather than a whole-time profession; so that for a very large charge on the public purse the standard of midwifery would be lowered rather than raised.

A third suggestion considered by the committee is that the midwife might be paid a basic salary in addition to her fees by an association or the local authority, with or without State assistance. The committee think that this might be desirable in certain areas but note that it has not usually been considered very satisfactory.

3. The *establishment of an organised service* under the local authorities is the method favoured by the committee.

AN ORGANISED SERVICE

It has been stated with authority that there are better conditions for midwives and lower maternal mortality-rates in countries like Sweden, Denmark, and the Netherlands where the midwives are regulated by the local authorities and fees are paid as whole-time or part-time salaries. The committee find it difficult to obtain accurate comparative records of the efficiency of independent midwives compared with those in a municipal service, but think that on the whole the latter groups show better results. They believe that an organised service throughout the country would result in great improvements in domiciliary midwifery. For one thing, it would attract a better class of woman to the service, since the present uncertainty makes it impossible to be sure of a living. Other advantages would be better coördination, chance of promotion, pensions, improved training and provision for necessitous patients. Overlapping of the work of the health visitor and antenatal clinic could be prevented and many serious gaps filled in. As members of the same service, midwives would work in close relation with health visitors and clinic and hospital doctors. Reserve staff for illness, quarantine, and holidays could be provided economically. The lack of scope for promotion is one of the most serious drawbacks of the profession as at present arranged. An organised service would also make it possible for interchangeability of posts, a provision of great educational value. The difficulties presented by necessitous patients would vanish.

For these reasons the committee have decided to recommend the establishment of a municipal salaried whole-time midwives' service for all areas not already adequately served by salaried midwives. The remainder of the report is devoted to the outline of a scheme for putting this recommendation into effect. The principal points in the scheme are set out in the following summary of recommendations.

SUMMARY OF RECOMMENDATIONS

1. That this committee concurs with the views expressed in the reports that, although adequate hospital accommodation for antenatal cases and abnormal confinements is essential, normal confinements can be satisfactorily, safely, and preferably conducted in the patient's own home, except where this is unsuitable.

2. That the nursing of every maternity case should be conducted by a qualified midwife, and unqualified persons should not be permitted to nurse maternity cases for gain. It should be the duty of the local authority to provide that midwives are available to act as maternity nurses in the case of any patient who has engaged a doctor for her confinement but is unable in addition to afford the services of a trained nursing attendant.

3. That a salaried midwives' service should be established under the appropriate local authority in all areas not already served by salaried midwives. It is not intended to interfere with the continuance in practice of independent midwives.

4. That it should be the duty of every appropriate local authority to provide or secure the provision of an adequate domiciliary service of midwives in its area and for this purpose: (*a*) to employ the requisite number of whole-time midwives at adequate salaries; and/or (*b*) to aid approved voluntary organisations (including provident societies) that employ salaried midwives for service in its area.

5. That the local supervising authority (Midwives Acts) should be the unit of administration for the proposed service.

6. That the cost of the service should so far as practicable be met by the fees charged by and payable to the authority or the voluntary organisation for the services of the midwife.

7. That before initiating a scheme for its area the local supervising authority should consult with representatives of the hospitals, nursing associations, and other voluntary organisations which are concerned in maintaining a salaried service of midwives, of the local midwives' association and of the general practitioners of the area with the following objects: (*a*) to provide effectively for the needs of the area; (*b*) to avoid duplication of services in any part of the area; (*c*) to ensure substantial equality in rates of pay and conditions of service among the salaried midwives in the area; (*d*) to settle the fees to be charged for the services of municipal midwives, whether acting as midwives or maternity nurses.

8. That midwives entering the municipal service should receive adequate pay and allowances and pension rights

and be accorded the same status in every respect as health visitors.

9. That the average number of cases that the midwife would be expected to attend should not exceed 80 per annum in view of the increased work falling upon midwives as a result of recent developments of midwifery practice.

10. That first appointments to the midwives' service should be advertised by the local supervising authority, and such posts should be filled as far as possible from candidates who are practising within the area. In future, recruits to the service should be drawn from practising midwives or from midwives who have had recent experience in the labour wards or district of a recognised maternity hospital.

11. That midwives practising within the area of a local supervising authority who apply to enter the salaried service of that authority within twelve months of its institution and who are not accepted, or who after entering are required to leave within two years for reasons other than misconduct, and who undertake not to practise further within the area of that authority, should be entitled to compensation the rate of which should be based upon three years' purchase of the net value of their practice calculated over a period of five years.

12. That after the new Act has come into operation the local supervising authority should require midwives in independent practice within the area who from their age or physical or mental infirmity are unable to carry out satisfactorily midwifery practice, to retire upon receiving an adequate pension having regard to all the circumstances of the case.

13. That the general supervision and inspection of midwives should be carried out by midwives experienced in actual practice acting under the direction of the medical officer of health.

14. That every midwife should be required to take a refresher course including, if necessary, a two months' residence in a training institution, at regular intervals not exceeding seven years. In order to make this possible it should be the duty of the local supervising authority, in consultation with the Central Midwives Board, to make provision for such refresher courses. It should further be the duty of the local authority to provide the allowances necessary for any midwife practising within the area to take such courses (including the provision of a locum tenens).

15. That a midwife should have the right of appeal to the Minister of Health against decisions of the local supervising authority which affect her personally but do not apply to the general body of midwives in the area, with the exception of matters subject to the jurisdiction of the Central Midwives Board.

16. That each woman who applies for the services of a municipal midwife should be allowed to select the midwife she prefers in so far as circumstances permit.

CONCLUSION

The committee believe that the low rate of maternal mortality in the "districts" attached to voluntary hospitals is due to two main causes. First, the close association and availability of junior members of the obstetric staff to visit promptly when needed, and the development of team-work. Secondly, the personal contact of the midwife with the patient, constituting an unbroken chain of personal interest and responsibility. The committee therefore desire very much that the same close relationship between midwives, hospitals, and clinics, and the same spirit of personal and sympathetic interest in the individual patient, on the part of all concerned, will be aroused and maintained in the municipal midwives' service which they hope to see established.

ROYAL FREE HOSPITAL.—In accordance with the wishes of the late Lord Riddell, the Royal Free Hospital has decided to use the money contributed to the Riddell wreath and memorial fund in endowing beds and cots in the hospital in his name. Over £1700 was contributed.

MEDICINE AND THE LAW

Drawbacks of Workmen's Compensation Law

THE report of the B.M.A. Committee on Fractures summarised in THE LANCET last week contained an interesting appendix on "non-medical factors of prolonged disability," which referred to the operation of the Workmen's Compensation Acts. It suggests that, although the Acts are meant to protect the workman, they tend to delay his return to work and they sometimes even convert him into a permanent invalid. The cash benefits may do him and his family positive harm; the Acts do not oblige him to show that he has sought and obtained proper medical treatment, and they make no provision for rehabilitating him after injury. The appendix discusses the following three points in particular—prevailing methods of insurance, scarcity of light work, and the question of lump sum payments.

Methods of insurance.—Three methods are adopted by employers at the present time for insuring against their liabilities for injuries to their workmen: (1) through insurance companies; (2) by mutual association of groups of employers; and (3) by individual employers. Under (1) the insurer is concerned not with the man's recovery as such, but with the settlement of a claim. Measures, such as those proposed in the report, which will reduce the total incapacity periods of the insured, will not necessarily be welcomed by insurance companies, since they must involve an eventual reduction of income through the lowering of premiums. Methods (2) and (3) are applicable only to firms employing large numbers of men, but they have the great advantage that the economic interest of the insurer is implicit in the recovery and the ultimate welfare of the disabled man. It would therefore seem advisable to make some effort to increase the number of employers who, like the railway companies, run their own insurance.

Scarcity of light work.—One of the main difficulties experienced is the return of the convalescent man to suitable work. It is obvious that, when recovering from an injury such as a fractured leg, he will not be unfit for his ordinary work one day and fit for it the next. There must be a time when he is fit for light work only, and would be benefited by the provision of such work. Such provision, in the present industrial conditions, meets almost insuperable obstacles. Unless and until the injured workman is able to perform the full and complete work of his usual job, his chances of employment are small. Meanwhile he not only finds it almost impossible to obtain suitable light employment, but is actually afraid to take up work that might prove too much for him, and lead later to his discharge in favour of a man more physically fit, there being no dearth of substitutes in the present state of the labour market.

The "*lump sum*" *form of compensation* is responsible for much prolongation of disability. The prospect that a large sum of money may eventually be obtained if the applicant is persistent and patient enough is sufficient in many cases to deter the disabled worker from seeking or even desiring to obtain restoration of function. Further, to return to work before the settlement of the claim would probably result in a diminution in the amount of "lump sum" compensation. The worker is in an unaccustomed atmosphere, created by an insurance company, his trade union, his approved society, his employer, the medical officers employed by those bodies, his own medical practitioner, and, perhaps, a relieving

officer. It is small wonder that, until the compensation claim is settled, the worker's attention is focused on his financial prospects rather than on his restoration to full activity.

The curious mental state of an injured worker, prolonged until the final award is made, is well known in other kinds of litigation. In actions for personal injuries—e.g., in traffic accidents—it is common for counsel to suggest to a medical witness that the plaintiff's health may take a sudden turn for the better as soon as the case is over. The appendix to the committee's report recommends that delay in settlement of workmen's compensation cases might be cut down by better use of the services of medical referees or independent medical assessors. Certainly the official statistics indicate that inadequate use is at present made of medical referees under the Workmen's Compensation Act. The grand total of cases in the year was 366,875. On only 58 occasions was a case referred to medical referees by a judge, arbitrator, or committee (under para. 11 of Schedule 1) for report. This general power of referring "any matter which seems material to any question arising in the arbitration" might surely be developed.

Damages for Puerperal Fever

The Court of Appeal disagreed on Feb. 8th in a case turning on the responsibility of the Lindsey county council for the actions of the matron and staff in the Cleethorpes Maternity Home, one of a group of homes maintained by it under its new powers. Mr. E. W. Cave, K.C., for the defendant council, asked and obtained leave to appeal to the House of Lords.

The facts, as stated by Lord Justice Greer in his judgment, were that the plaintiff, Mrs. Marshall, called at the home in January or February, 1933, saw the matron, and told her that her doctor had recommended her to go to the home for confinement and would attend her. She asked for a private ward, and the matron said that the terms were four guineas a week and that the room would be ready on July 4th, the date specified by Mrs. Marshall. On June 30th a Mrs. Franklin was admitted and placed in Ward 7. She was taken to the theatre and delivered by a Nurse Siddle on the morning of July 1st, and then taken back to Ward 7. Next day she was taken to the Gray ward, where there were two other patients, and Nurse Siddle continued to attend her. On July 3rd she had a morning temperature of 100·4° and an afternoon one of 100·6°, so her condition was notified as puerperal pyrexia. On the evening of July 4th her temperature went to 105° and a local doctor sent her to Grimsby General Hospital, where she was diagnosed as a case of puerperal sepsis. When she was sent away from the home the matron caused the nurses to take lysol baths and appropriate gargles; the two other patients in the Gray ward were moved to No. 7 and the Gray ward was thoroughly disinfected in the usual way and sealed till the next morning. The steps taken were approved by Dr. Campbell, the county medical officer, and Dr. Stott, his assistant, who was in charge of the home. Nurse Siddle was relieved from duty for two days. Ward 7 was not disinfected. Another patient admitted on July 9th also became notifiable and bacteriologically positive. On July 12th four other patients went in.

On the evening of the 12th Mrs. Marshall, the plaintiff, and her husband arrived at the home and were told that no private room was available and she would have to go for a time into a public ward. Nothing was said to them about Mrs. Franklin's case. She was taken to Ward 7, later delivered by her doctor's assistant, and then placed with two other patients. On the 16th the four patients who had entered just before her developed a warning temperature, and on the 17th the plaintiff showed fever, and a few days later was sent to the fever hospital, where she suffered from puerperal sepsis. At assizes the jury found that the county council, through the matron and staff, had committed a breach of duty in not warning Mrs. Marshall, her husband, or her doctor of Mrs. Franklin's case, in not refusing admission to new patients from July 5th onwards, and in not taking swabs from the whole staff immediately on the report of Mrs. Franklin's case.

Lord Justice Greer and Lord Justice Roche delivered judgments upholding the finding of the jury on these points, and the damages of £750. Lord Justice Maugham delivered a strong dissenting judgment which, if approved by the House of Lords, would presumably extend the immunity given to hospital authorities for the acts of expert members of their staffs by Hillyer *v.* St. Bartholomew's Hospital 1909 (2 KB 820). He pointed out what was not contradicted in the majority judgment: that the defendant council could not be held liable for the actions of Dr. Campbell and Dr. Stott, as they were competent independent medical advisers. He thought that on the same principle the council were not even liable for the actions of the matron and staff; he considered that the staff were acting under the direction of the doctors and that the county council had neither the duty nor the power to insist on any line of treatment or any method of disinfection of the home. Nor, he thought, was there any evidence from which to infer that the question of giving warning to a patient was one to be decided by the defendants or their agents. He also expressed the strong view that no such warning was, in the circumstances, desirable.

The House of Lords, if the appeal proceeds, has the opportunity to deliver a judgment of great interest to local authorities which administer hospitals.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

A PUBLIC MEDICAL SERVICE

A VERY large proportion of the general practitioners of the city are now members of the Edinburgh Public Medical Service inaugurated last October. In an address delivered last week under the auspices of the Edinburgh Women Citizens Association Dr. John Young explained that the service has been set up by the medical profession itself, and has the full approval of the British Medical Association. It meets the needs of the dependants of insured persons, one dependant paying 4*d.* per week, and the maximum of four or more dependants paying 1*s.* per week. It also covers other persons whose income is not more than £250 a year, and there is a free choice of doctor. During its first quarter 5000 patients enrolled. The service is not meant, of course, for cases coming under the public assistance scheme of the city or for patients who can pay for their own doctor. In addition to medical attendance, medicines are supplied, but neither anæsthetics, vaccines, nor statutory certificates; nor are attendances at confinements included. The central office has a collecting staff, and the collections are made

weekly, monthly, or quarterly. Subscribers may change their doctor at any time.

UNIVERSITIES AND THE OSTEOPATHS BILL

Aberdeen University court has concurred in a recommendation of the senatus that it should oppose the Osteopaths Bill now before a Select Committee of the House of Lords. It was decided to request the other Scottish universities to join in making a representation to the Select Committee.

TENDENCIES IN OBSTETRICS

At a meeting of the Edinburgh Obstetrical Society last week Dr. J. S. Fairbairn read a paper entitled Changes and Tendencies in our Branch of Medicine. He drew attention to the alteration in the attitude of profession and public to the problems of childbirth during the past half-century. Where the profession fails to fulfil the ideals of present day, he thought, is chiefly in its failure to make its practice primarily one of constructive physiology. He emphasised the importance of work done by almoners in supplementing the work of antenatal clinics, and gave an account of the almoners' work at his own hospital in London, St. Thomas's. Close attention, he believes, should be paid to the psychological side of pregnancy, particularly with a view to allaying the fear of labour and also of the economic upset that childbirth causes.

CORRESPONDENCE

PERIOD OF INCAPACITY IN FRACTURES

To the Editor of THE LANCET

SIR,—In your admirable leading article last week, in which the report of the Committee on Fractures of the British Medical Association is reviewed, reference is made to the fracture clinics at St. Bartholomew's Hospital. You state that "it would be of great interest if the results of the large fracture clinics could be compared, not with those of bad treatment, but with those obtained at the smaller units existing at many well-organised hospitals throughout the country, of which the system at St. Bartholomew's Hospital . . . may be taken as an example." Each of the five surgical units of this hospital holds a weekly fracture clinic, at which all the fracture cases, both those which have been in-patients, as well as those which have been ambulatory all the time are seen.

Below are given the results of treatment in the fracture clinic of the surgical professorial unit at St. Bartholomew's Hospital. The figures were collected some months ago and have not been published.

Average Incapacity Periods

Site of fracture.	*Cases.*	*Incapacity period in weeks.*
Clavicle	16	7
Humerus: surgical neck and shaft	19	10
Radius: head	17	6
Colles's fracture	61	6
Tibia: shaft	15	19
Tibia and/or fibula: lower end, without dislocation	30	8
Tibia and fibula: lower end, with dislocation	11	16

The total number of cases is very small compared to those given in the British Medical Association's report, but the average incapacity period compares, I think, favourably. The results of fractures treated in another of the surgical units at this hospital were reported by Mr. Rupert Corbett in 1930 and showed very similar figures for the average disability period. It surely is not the size of the clinic which makes for good results in the treatment of fractures so much as the keenness and interest shown by those in charge. Indeed, you say: "The ideal size for any clinic is that which allows the surgeon to supervise all his cases personally." Good results can be obtained in fracture work if a personal interest taken in the cases is combined with a knowledge of modern methods, provided the main principles of treatment—namely (*a*) reduction of the deformity, (*b*) immobilisation of the fracture until consolidation is firm (so often forgotten), and (*c*) active use of the uninjured regions and re-education—are not ever forgotten. These good results will be obtained whether the clinic be large or small, or if only a single patient is being treated.

I am, Sir, yours faithfully,

JOHN HOSFORD.

St. Bartholomew's Hospital, Feb. 18th.

UTERINE CONTRACTION

To the Editor of THE LANCET

SIR,—In your issue of Jan. 5th Dr. Chassar Moir responds to my letter of an earlier date, also published in THE LANCET (Dec. 22nd, 1934), in which I raised a point concerning his excellent work on the contractility of the human uterus. May I reply by a brief restatement of the issues as I see them?

The criticism which I made was simply this: inasmuch as uterine tone is less in the latter half of the sex cycle than in the early part, as Dr. Moir agrees, then it follows that a balloon placed within the uterus will have a relatively greater volume in the latter part of the cycle than earlier, provided the distending force within the balloon is initially the same in both instances. This holds for the small balloons of 0·8–1·5 c.cm. capacity, such as I use in uterine fistulæ, or one of 3·2 c.cm. capacity as Dr. Moir employs, or with a still larger one as Prof. Knaus uses. The point to be stressed is the relative difference in volume of the balloon in the two phases of the normal menstrual cycle, when the same balloon and the same distending tension are employed. My criticism is not, therefore, as Dr. Moir says, "not only negatived but actually reversed." It is physiologically sound, for the reasons stated in my first communication.

A statement in my earlier letter, to which Dr. Moir refers, is evidently not understood by him. I did not say that he distended the uterus "chemically," but rather that if contractions are induced by distension (mechanical means), or by chemical means—e.g., pituitrin, vasopressin—the contractions give a net recorded effect of considerable magnitude, when uterine tone is low, even though the contractions be very weak indeed.

Finally Dr. Moir says my suggestion offers no explanation of why vasopressin is effective at all stages of the sex cycle. Indeed, I did not feel it incumbent upon me to tell *why* this is so; I accepted the fact that with his technique conditions are as Dr. Moir finds them, and chose only to state the consequences of such induced contractions in physiological terms when the uterine tone is high on the one hand, and on the other, low.

I conclude by agreeing with Dr. Moir that the problem of uterine contractility is a complicated one indeed. It is for that reason that I regard his important work as of the first order, and I sincerely

congratulate him on the recognised advance he has made in this field of study.

I am, Sir, yours faithfully,

SAMUEL R. M. REYNOLDS.

Department of Physiology and Pharmacology, Long Island College of Medicine, Brooklyn, N.Y., Jan. 21st.

PS.—On re-reading this letter I find that it does not explain, as I had hoped, the discrepancy between Dr. Moir's results and those of Prof. Knaus, since conditions in both sets of experiments appear to be somewhat similar. My criticism should apply with equal force to the work of both. It will be interesting, therefore, to see what the "direct experimentation" which Dr. Moir promises may hold in the solution of the perplexing discrepancy in the results of these two investigators.

DIAGNOSIS OF VITAMIN-C SUBNUTRITION BY URINE ANALYSIS

To the Editor of THE LANCET

SIR,—I should be grateful if you would allow me to correct an error in my paper with Dr. S. N. Ray under the above title (Jan. 12th, p. 72). The sentence: "The dye is made up in watery solution, at a strength of about 0·05 per cent., so that 0·05 c.cm. is equivalent to roughly 0·025 mg. of ascorbic acid" should have read *0·10 per cent.*, and not 0·05 per cent.

As I learn that this test is already being tried out by a number of clinical workers, I should like to take this opportunity to stress again an important point of technique, alluded to in the original paper. This is, that if a negligible response is given by the first dose of ascorbic acid another test dose should be repeated the next day, and even a third where necessary. Only by this procedure is it possible to distinguish between moderately low reserves and the more severe degrees of deficiency. A person with moderately low reserves may give a negligible response the first day, but an appreciable response the second. We hope to publish shortly a more detailed study setting out these results on a quantitative basis. In the meantime perhaps it seems advisable to emphasise again that the test dose of ascorbic acid should not be less than that which we advocated (600 mg. for an adult of normal weight), and that the results should be based on determinations on whole day outputs of urine, and not on single isolated samples.

I am, Sir, yours faithfully,

LESLIE J. HARRIS.

Nutritional Laboratory, Cambridge, Feb. 18th.

"SECONDARY MARBLE BONES"

To the Editor of THE LANCET

SIR,—There are objections to the use of the above term for the descriptions of bones which have increased in density owing to invasion of the bone by carcinomatous metastases from the prostate. Albers-Schönberg coined the term "Marmorknocken" to describe an osseous dystrophy in which all the bones showed evidence of a peculiar "transformation" of the normal skeleton into one of great radio-opacity. In those cases of prostatic carcinoma associated with metastases in bone which produce an osteoplastic reaction, although Dr. Parkes Weber in your last issue states that "the bones become infiltrated by millions of minute metastases, mostly smaller than miliary," we often find radiographically a very irregular disposition of the bony changes; thus one vertebral body or half the side of the pelvis may show the changes but the other bones may appear to be of normal appearance. There is not the uniformity of transformation seen in marble bones; neither is the osteoplastic reaction restricted to prostatic carcinomatous metastases, for many conditions including osteomyelitis, syphilis, Paget's disease, von Recklinghausen's neurofibromatosis, osteogenesis imperfecta, &c., are associated at certain stages with bones of great density. Not all metastases from carcinoma of the prostate give rise to an osteoplastic reaction—osteolysis is as frequent in my experience. Further, if the malignant cells had the osteogenic powers which are suggested we could expect all metastases in a case showing an osteoplastic reaction to show new bone formation.

For these reasons I suggest that the term "marble bones" be restricted to the osseous dystrophy first described by Albers-Schönberg.

I am, Sir, yours faithfully,

JAMES F. BRAILSFORD.

Edgbaston, Birmingham, Feb. 18th.

BODY-WEIGHT IN RELATION TO DISEASE

To the Editor of THE LANCET

SIR,—In the account of the discussion on Body-weight in Relation to Disease held at the Medical Society of London on Feb. 11th and reported in your issue of the 16th, there are several misstatements which I should be grateful if you would give me the opportunity to correct.

In discussing obesity in association with endocrine disease, I suggested that it was commonly found with pituitary tumours, especially the chromophobe and basophil adenomata. In typical cases of anterior lobe deficiency (Simmonds's disease) cachexia was observed, whilst in children with suprasellar cysts obesity or cachexia might be found. Another group of endocrine patients who became fat were those with adrenal (not renal) cortical tumours, whilst in hypothyroidism (not hyperthyroidism) the individual might become either fat or thin.

With regard to the report of my subsequent remarks on the sugar tolerance in obesity, the impression is, I think, given that we investigated a number of individuals over many years from the age of 12 to 60. This is incorrect. I mentioned that, whilst in endogenous cases in children the sugar tolerance was usually high, if a number of individuals of a similar type were examined in later life, their sugar tolerance was then usually decreased and some showed glycosuria. On the other hand, cases of obesity showing evidence of over-feeding were apt to have at the start a decreased tolerance and not the reverse as the report suggests.

I am, Sir, yours faithfully,

HAROLD GARDINER-HILL.

Wimpole-street, W., Feb. 15th.

MEDICAL PSYCHOLOGISTS NEEDED IN THE NORTH

To the Editor of THE LANCET

SIR,—May I draw attention to the great need for medical psychologists in the North of England. In the course of my pastoral work I have come across many cases of psychoneuroses which are problems for the medical psychologist; yet I do not know of any mental specialist or clinic in the north where I can send these people for treatment. The wealthier patients are able to go to London, but the large majority have not the time or means for a lengthy stay in London. What is happening? In many cases this highly important work of healing the mind diseased is being attempted by self-styled psychological practitioners (many of them ministers of

religion) who have not had the necessary scientific training in general and psychological medicine.

Can your readers offer any suggestions as to how this need can be met? Could not some medical psychologists establish themselves in large northern centres? They certainly would not lack patients. This is one of the most urgent needs I know of.

I am, Sir, yours faithfully,

Feb. 8th. "CURE OF SOULS."

SKIN LESIONS ASSOCIATED WITH THE WISDOM TOOTH

To the Editor of THE LANCET

SIR,—I was very interested to read Dr. Elizabeth Hunt's letter in THE LANCET of Feb. 16th, p. 401. I regret that owing to limits of space it was not possible to record every complication of third molars which I encountered. I have, however, records of eight cases of skin disease, four being herpes and one herpes after extraction.

CASE 1.—Sudden onset of neuralgic pain followed by swelling and herpetic eruption of right cheek. Temp. 100°. The herpes proved intractable and the neuralgia settled down as a trigeminal neuralgia of the second division. The right upper wisdom tooth was impacted high up against the second molar and the left lower was impacted obliquely. Three days after extraction of the right upper second molar, which showed absorption of its root, the herpes began to clear up and there was no recurrence.

CASE 2.—A female, aged 30, had three attacks of herpes at the corner of the right upper lip. There was no recurrence after the removal of a buried right lower wisdom with a long tapering root slightly hooked round the mandibular canal.

CASE 3.—Recurrent patches of herpes on the cheek completely disappeared on the removal of an impacted wisdom of the same side.

CASE 4.—A woman, aged 25, had an area of herpes over the right mental foramen; it had been treated by a skin specialist for several months without result and the patient was depressed to the point of melancholy. The unsightly crop disappeared completely on extraction of a buried right lower wisdom and did not recur.

CASE 5.—A young woman had a partly erupted left lower third molar with a typical hood of gum over it. The tooth was extracted under gas and next day the pain had increased. On the second day an herpetic eruption appeared along the distribution of the third division of the trigeminal nerve. The condition ran a usual course.

These five cases were kindly supplied to me by Mr. J. Edgley Curnock, Mr. K. McAllister, Dr. Helen Boyle, Dr. H. C. Semon, and Mr. H. S. Woods.

CASE 6.—Surgeon-Commander A. Lawrey has published in the *Naval Medical Journal* for 1933 a case, of which he kindly sent me particulars, of a sailor who suffered from furunculosis due to infection of a buried and horizontally impacted third molar with an unerupted supplementary tooth lying horizontally across its neck.

CASE 7.—The only case of toxic eruption I have found was supplied me by Mr. F. B. Bostwick, of Gibraltar, who had a patient in very poor health whose hands broke out in a very severe toxic rash. This disappeared and his general health improved when a badly infected impacted wisdom tooth was discovered and removed.

CASE 8 (of which I possess a photograph) is that of a dental nurse, aged 21, who suffered from an almost perpetual sub epidermal rash over the part of the chin supplied by the mental branch of the inferior dental nerve on the side on which she had a buried impacted wisdom tooth.

Rashes of this type on one or both sides of the lip and chin are not uncommon during the period of eruption activity of the third molars and are due, I think, to pressure irritation rather than infection. Similar rashes are also seen in children during the cutting of the anterior molar teeth and sometimes these take on an herpetic character. The daughter, aged 7½, of a medical colleague has suffered regularly from such a rash every time she has "cut" either a deciduous or a permanent molar tooth. This rash comes up overnight in the form of groups of herpetic blisters on the chin. It lasts for about a fortnight and is accompanied by the usual symptoms of tenseness in the gum over the active tooth.

I am very pleased to have the opportunity of adding Dr. Hunt's case to my collection. Curiously enough, I have not found a single case of skin disease in my 350 examples of complicated wisdom teeth culled from the literature.

I am, Sir, yours faithfully,

C. BOWDLER HENRY, M.R.C.S., L.D.S.

London, W., Feb. 25th.

WHAT IS MALNUTRITION?

To the Editor of THE LANCET

SIR,—Under the above heading in a leading article on Feb. 16th you included amongst the difficulties of definition the varied standards of the observer, and exemplified this point by alluding to the fact that Bootle was reported to have a malnutrition rate 12 times as high as Liverpool. In refutation of the implied slur on the physique of Bootle children, or alternatively in defence of the standards used by my colleagues in assessing that physique, I would draw attention to the close correspondence of their findings with those recorded after the examination of about a quarter of a million children annually by the London school medical staff. The percentage figures in 1932 were for London 4·9 per cent., and for Bootle 4·1 per cent.; in 1933 they were 4·7 per cent. for London and 5·3 per cent. for Bootle.

I am, Sir, yours faithfully,

F. T. H. WOOD,

Feb. 18th. Medical Officer of Health, Bootle.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 9TH, 1935

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 0; scarlet fever, 2901; diphtheria, 1991; enteric fever, 23; acute pneumonia (primary or influenzal), 1349; puerperal fever, 51; puerperal pyrexia, 105; cerebro-spinal fever, 17; acute poliomyelitis, 3; encephalitis lethargica, 4; dysentery, 27; ophthalmia neonatorum, 77. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on Feb. 18th–19th was as follows: Small-pox, 0 under treatment, 0 under observation; scarlet fever, 1301; diphtheria, 2114; measles, 123; whooping-cough, 300; puerperal fever, 15 mothers (plus 6 babies); encephalitis lethargica, 268; poliomyelitis, 3; "other diseases," 290. At St. Margaret's Hospital there were 17 babies (plus 6 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there was no death from small-pox, 3 (0) from enteric fever, 9 (0) from measles, 11 (2) from scarlet fever, 19 (0) from whooping-cough, 63 (5) from diphtheria, 43 (20) from diarrhœa and enteritis under two years, and 91 (10) from influenza. The figures in parentheses are those for London itself.

For two weeks past there has been some increase in the number of deaths attributed to influenza, the total deaths for the last few weeks (working backwards) being 91, 71, 56, 58, 59, 54. This week the deaths attributed to influenza were distributed over 48 great towns, Manchester and Birmingham each reporting 7, Bolton 5, Southport, South Shields, Wigan, Bristol, Nottingham, and Merthyr Tydfil each 3. There were 4 deaths from diphtheria at Leeds, Liverpool, and Birmingham, 3 each at Portsmouth, Manchester, and Sheffield. Hull reported 4 deaths from measles, Sunderland 6 deaths from whooping-cough. The fatal cases of enteric fever occurred at Leyton, Watford, and Blackpool.

The number of stillbirths notified during the week was 296 (corresponding to a rate of 46 per 1000 total births), including 42 in London.

OBITUARY

DANIEL COLQUHOUN, M.D., F.R.C.P. Lond.

THE death is announced of Dr. Daniel Colquhoun, who qualified in London from Charing Cross Hospital as L.S.A. in 1876, having received previous medical training in Glasgow. He graduated in medicine at the University of London in 1880 and in the same year took the diploma of M.R.C.P. London. He served the house appointments at his hospital, and shortly afterwards went to Dunedin, where he died last week. In Dunedin he acquired both a high reputation and a large practice and was appointed quite shortly professor of medicine in the University of Otago. He was elected F.R.C.P. London in 1907. As a lieutenant-colonel with the New Zealand Expeditionary Force he visited London in connexion with Red Cross activities. At the time of his death he was emeritus professor of medicine at Otago.

DANIEL DRAKE LEE, M.D. R.U.I., M.Ch., M.A.O.

THE sudden death occurred on Jan. 19th of Dr. Daniel Drake Lee, a well-known practitioner in Kettering and the neighbourhood. Dr. Lee was the sixth son of William Lee, a prominent landed proprietor of Darragh, Co. Limerick, by his wife Ellen Drake. He received a classical education at school, but decided on the profession of medicine. He started on the curriculum at Queen's College, Glasgow, and graduated as M.B. R.U.I. in 1883. He later took the degree of M.Ch., M.A.O., and proceeded to the M.D. at the Royal University. He held several appointments as assistant before starting in practice at Kettering in 1890, and had been nearly 44 years in the town at the time of his death. In Kettering he discharged many offices. When the Kettering and District General Hospital was first opened he became surgeon to the institution, a post which he filled as a member of the active staff until 1926 and as a consultant until the time of his death, thus working for the hospital in an honorary capacity for 40 years. In addition to his post at the general hospital he was medical officer to the isolation hospital, and was also an enthusiastic supporter of ambulance work, taking a practical interest in the local branch of the St. John Ambulance both as surgeon and instructor. The war found him too old for foreign service, but he had charge of German prisoners locally, while at a period when medical aid was in exceptional demand, he met the claims of professional duties untiringly. Dr. Lee was a prominent member of the catholic church, and by his death the neighbourhood has lost a man of ability, experience, and fine character.

Dr. Lee married in 1900 Miss Jennie Donellan, a Limerick lady, and leaves a widow and children, one of whom, Dr. William Drake Lee, was associated with him in practice.

GEORGE RICE, M.B., C.M. Edin.

THE death of Dr. George Rice occurred on Feb. 14th at Sutton, Surrey, where he had been in medical practice for over 50 years. He was born at Troy, U.S.A., educated at Dartmouth College, New Hampshire, and came to Europe to pursue medicine, commencing his studies in Paris where he was living at the outbreak of the Franco-German war. This led to a break in his education and he migrated to the University of Edinburgh to continue his work. He graduated as M.B., C.M. Edin. in 1874 and became house surgeon at the Edinburgh Royal Infirmary, where his immediate chief was Lister, who always later took a personal interest in his career. He made a very favourable impression upon his juniors at the Infirmary, for on giving up his appointment as house surgeon he received a presentation from those who had been clerks and dressers under his supervision. From Edinburgh he went to the Manchester Royal Infirmary as house physician, and thereafter held resident appointments at the Chorlton Union Hospitals and the Woolwich and Plumstead Infirmary. He also held office under the Metropolitan Asylums Board at the Downs Ringworm Hospital, and was for a time resident medical officer at the Fulham Workhouse. He went to Sutton in 1884, conducted a successful practice, and filled many local appointments; he was public vaccinator for Sutton, Cheam, and Carshalton until September of last year, dying almost in harness at the age of 87.

In 1881 Dr. Rice married Florence Mary, daughter of Mr. John Cook of Plumstead, who died a little over a year ago. They celebrated their golden wedding in 1931. Dr. Rice is survived by one daughter.

MILNER MONTGOMERY MOORE, M.D. Durh.

Dr. Milner Moore, who died recently at Eastbourne, was one of the oldest members of the medical profession, having reached the great age at the time of his death of 95. He was born in London in 1839, the son of Dr. Duke Moore, who was apothecary to the Royal Household in 1835, and attended Queen Adelaide in her confinement. He was educated at Newport, Salop, and, proceeding for his medical training to St. Mary's Hospital, qualified as M.R.C.S. England in 1863, became L.R.C.P. London in the following year, and in 1880 graduated as M.D. Durham. At St. Mary's Hospital he held the house appointments and then became house surgeon to the Royal Albert Hospital, Devonport. Returning to St. Mary's as resident obstetric officer, he held this post for three years, 1866–69, later becoming anæsthetist to the hospital. At the close of his connexion with St. Mary's he went to Coventry, and practised in that city for nearly 40 years, during many of which he was surgeon to the Coventry and Warwickshire Hospital. He then settled in Eastbourne where he practised until his retirement. He was one of the founders of the Eastbourne Eye Hospital and acted as secretary until some five years ago.

Dr. Milner Moore married Caroline, daughter of commissary-general R. H. Smith, and the descendant of an old French noble family, who predeceased him.

THE LATE DR. JAMES COLLIER

N. H. S. writes: "The large attendance at the memorial service was proof of the affection and respect of Dr. Collier's colleagues, and the notice in your last issue gave an impressive account of his achievements in medicine. They may have come as a surprise to many of his pupils, for Dr. Collier, in addressing them, gave no hint of his own contributions to neurology. He was boastful for others but not for himself. As a teacher Dr. Collier was one of the chosen few with a genius for impressing his pupils so that they never forgot the important points, and were inspired to further efforts. His methods of imparting knowledge were his own and his gift for dramatising disease was unforgettable. He will be personally missed by

hundreds who never came nearer to him than the lecture hall. And women owe a special debt to Dr. Collier. For 19 years he lectured regularly to the nurses at St. George's Hospital at 8 o'clock in the evening, and in the words of the matron, 'was as enthusiastic at the last as at the first.' Qualified women were admitted to his crowded classes on equal terms with men; he had several as house physicians, who, though they may sometimes have been puzzled by his lightning flights from comedy to solemnity, will remember with gratitude how impartial and how kind he was."

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Unemployment Relief Regulations

REPLYING to the debate on the second reading of the Unemployment Assistance (Temporary Provisions) Bill, which was moved in the House of Commons on Feb. 12th by Mr. R. S. HUDSON (Parliamentary Secretary to the Ministry of Labour),

Mr. OLIVER STANLEY (Minister of Labour) said that the statement in the *Daily Herald* that the Cabinet ordered the Unemployment Assistance Board to cut down the cost of the Regulations by £5,000,000 to £10,000,000 to effect an economy was completely untrue. He did not attempt to disguise the fact that he gave the House the impression that the effect of the Regulations would be to increase the payments to those on transitional benefit at the rate of something like £3,000,000 a year. How wrong that estimate was, and, if so, why, close inquiry into the first few weeks' operation of the Regulations would reveal. Some difference had undoubtedly been made by the fact that in a considerable number of cases inquiries by the Board's officers had discovered in families larger resources than had been revealed to the public assistance committees. It was his feeling that the financial picture he painted in December—and on the faith of which to a large extent the House accepted the Regulations—was not accurate; this was the thing that induced him to make representations to the Board which ended in the statement made last week and the introduction of the present Bill. The suggestion that he, or any other Minister would have deliberately attempted to mislead the House on a question of this kind was fantastic.

With the strain thrown on the machinery of the Board in the new scales of payment, and particularly of repayment of the reductions, any preparation for the "appointed day" had become impossible. The Government realised that the position in which local authorities were placed was no fault of their own, and that the appointed day was postponed to suit the convenience of the Board and of the Government. The Chancellor of the Exchequer intended to enter into immediate negotiations with the representatives of the local authorities to ensure that he could agree with them on compensation for the burden which had been put upon them by this indefinite postponement of date. With regard to the advancing of payments to some of the unemployed by the public assistance committee of Sheffield on Thursday, he received a message asking whether they were allowed to supplement. He sent the correct answer that there was no power under the law which enabled them to supplement the payments made by the Board, and there was nothing that he could do in the matter. Subsequently on their own initiative they went to the Board and entered into this arrangement by which they would advance the difference between payments made by the Board and the payments on the old scale and these would subsequently be repaid to them.

It was quite illegal to supplement and he had to tell the public assistance committee that; but it was possible with the consent of the Ministry of Health for the committee to advance these moneys to the applicants, and having discussed the arrangement with the Board the committee approached the Minister of Health to ask whether he would sanction it. Feeling that this arrangement was to expedite payment to the applicants—which the House wanted to see—neither the Minister of Health nor he saw any reason why they should withhold their concurrence. It was not used by the applicants in Sheffield to anything like the extent which it might have been, but it undoubtedly had the effect of meeting certain hard cases. He had a long list of places where it was done.

With regard to the possibility of supplementation by public assistance committees that of course was illegal as the law now stood, but instructions had been issued by the Board to their officers that any case where supplementation had been made by the local authority of transitional payment in the past was to be regarded by the officers as in itself creating a special circumstance which would entitle the officer to use his discretion to make up that supplementation, and entitle the applicant, if that discretion was not used, to make his application to the Appeal Tribunal. He did not want to exaggerate, as many had done, the evil effects and injustices which the Regulations had caused. Many thousands had benefited from the operation of the Regulations. But leaving aside all exaggerations and mis-statements he had found enough which he considered to be wrong, and which he did not think ought to be remedied by niggling or hasty methods. He wanted to reach a level where the House could have time for adequate consideration of this matter without feeling that hardship was being inflicted in the meantime.

He was not looking for anyone on whom to put the responsibility. He was certainly not going to put it on the officials of the Board. He believed that it would have been possible to operate these Regulations with less rigidity, but he was certainly not going to blame officials for failing to use a discretion which they either did not possess, or did not know they possessed. They had done their best to carry out their duties. Nor would he put the responsibility on the Board. The responsibility for submitting the Board's scales to Parliament was not the Board's but his own. He still believed that it was impossible for anyone to foresee with accuracy the general effect of the Regulations as a whole. This was not a time to think about reputations or responsibility. There was an emergency to be overcome. He believed the Bill would tide them over and give an opportunity for reconsideration. The Board were undertaking an immediate inquiry into the effects of these Regulations and would then propose to the Government what they considered to be necessary alterations. It would then be for the Government to consider whether these alterations were the right ones. Whatever changes had to be made the Government were determined that the system should be made in fact for the benefit of the unemployed. (Cheers.)

The Bill was read a second time and the necessary money resolution was agreed to in Committee.

The financial resolution was agreed to on report on Feb. 13th and the Bill passed through Committee and was read the third time.

On Feb. 14th the Bill passed through all its stages in the House of Lords and received the Royal Assent on the following day.

HOUSE OF COMMONS

WEDNESDAY, FEB. 13TH

Local Authorities' Building Programme

Mr. PIKE asked the Minister of Health (1) what instructions had been issued to local authorities by his department to the effect that before proceeding with any further

house building the authorities should see that existing corporation houses were fully and properly occupied; whether such instructions had been forwarded to the Sheffield City Corporation Housing Estates Committee; and to what extent such instructions had been carried out; (2) what instructions he had issued to local authorities in regard to imposing a means test upon applicants for houses owned and erected by the authorities; and what was the maximum income allowed for persons occupying four-, five-, and six-roomed houses, respectively. Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health) replied: The attention of local authorities has from time to time been drawn to the importance of the selection of tenants in a manner which will avoid any abuse of State and rate contributions, and the existence of unoccupied municipal houses would obviously be a factor to be considered by a corporation in preparing proposals for further building and by the Minister in considering those proposals. On neither of these matters, however, has my right hon. friend issued, or indeed has he any power to issue, instructions. The remaining parts of the questions therefore do not arise.

Mr. PIKE: Can the hon. gentleman say whether or not it is the opinion of the Ministry that a general comb-out of corporation estates is now advisable, and whether or not special restrictions can be imposed by his Department as to the application of a means test by those corporations to applicants for corporation houses?

Mr. SHAKESPEARE: I cannot answer my hon. friend's question as to what is the opinion of my Department. I can only say that the latest information on the subject was given to my hon. friend a few months ago.

Extension of Silence Zones

Sir JOHN PYBUS asked the Minister of Transport whether he would be prepared to consider applications from local authorities for the experimental extension of the silence zones in their own areas to the whole of the 24 hours.—Mr. HORE-BELISHA replied: Yes, Sir, I am prepared to give favourable consideration to any applications from local authorities for the experimental extension of the silence zones in their own areas to the whole of the 24 hours.

Brig.-General NATION: Would the hon. gentleman consider experimenting on the same lines in London?

Mr. HORE-BELISHA: Yes, Sir.

Imported Goats' Hair and Anthrax

Sir FRANCIS FREMANTLE asked the Home Secretary whether he was aware of the danger of infection with anthrax, with a high mortality-rate, from imported goats' hair; and whether he would take the necessary steps to ensure that all goats' hair imported into this country was thoroughly disinfected.—Sir JOHN GILMOUR replied: Yes, Sir. I am aware of the danger, and the question of extending the present arrangements for the disinfection of goats' hair has for some time past been engaging my close attention. The Bradford Chamber of Commerce have made certain representations on points of detail which are now under consideration. In these circumstances, I should be obliged if my hon. friend would repeat his question in a week's time.

THURSDAY, FEB. 14TH

Remand Homes under the Children's Act

Mr. MANDER asked the Home Secretary what progress had been made in connexion with the provision of remand homes under the Children's Act, 1933; and how many areas remained at the present time without adequate provision.—Sir JOHN GILMOUR replied: Many local authorities have had this question under consideration and several schemes for the coöperation of adjoining authorities have been completed or are in course of preparation. The problem is not easy of solution in areas where there is only a small number of persons for whom accommodation is likely to be required, but on the whole satisfactory progress appears to have been made. I am unable to answer the latter part of the question in detail, but the question of collecting further information will be considered at a later date.

Nursery-Schools in Slum Clearance Areas

Viscountess ASTOR asked the Parliamentary Secretary to the Board of Education whether, in view of the strong recommendation in favour of nursery-schools made by Sir George Newman in his report on the health of the school-child, he would endeavour to provide nursery-schools in connexion with all schemes for the clearance of slum areas.—Mr. RAMSBOTHAM replied: As indicated on page 64 of Sir George Newman's Report for 1933, the provision of nursery-schools on new housing estates, where the housing conditions are presumably satisfactory, is a less urgent matter than their provision in areas where the housing conditions are seriously defective. My noble friend is, however, prepared to consider on these merits proposals for the provision of nursery-schools on new housing estates where the inhabitants have previously been living under specially bad conditions, and where consequently the social conditions might be particularly unfavourable.

Maternal Mortality

Viscountess ASTOR asked the Minister of Health how many cases of maternal mortality in the period covered by the latest available official figures, were known to have a previous history of abortion or attempted abortion.—Sir HILTON YOUNG replied: If my noble friend is referring to cases in which abortion had taken place, or had been attempted, in connexion with pregnancies preceding the fatal pregnancy, I am afraid there are no figures available. But if the reference is to cases of abortion, or attempted abortion, in connexion with fatal pregnancy, I may say that the total of 2618 cases of maternal mortality in England and Wales in 1933 (deaths classified to Pregnancy and Childbearing) comprises 378 deaths attributable to abortion (including miscarriage)—viz., 257 classified to post-abortive sepsis, and 121 classified to abortion not returned as septic. There were in addition 97 deaths not classified to puerperal causes but returned as associated with abortion or miscarriage; and 85 deaths classified to criminal abortion on a coroner's certificate.

Viscountess ASTOR: When questions are put on the subject of maternal mortality will my right hon. friend remind hon. Members who put them that it is not only a question of lack of nutrition, but that there are many other things connected with the subject that up to now have not received sufficient attention?

Mr. COCKS: Cannot the right hon. gentleman do something through his Department to spread a knowledge of scientific birth control?

No further answer was given.

Inquiry into Nutrition of Children

Dr. ADDISON asked the Prime Minister if it was proposed to publish the report of the President of the Royal Society and other scientists that was made to the Government last year on the nutrition of children and kindred subjects.

Mr. MACDONALD replied: I assume that the right hon. gentleman is referring to a memorandum submitted last year by the Economic Advisory Council. This document was intended to be confidential and will not be published. Substantial effect is being given to the Committee's recommendations by the appointment, jointly by my right hon. friend the Minister of Health and my right hon. friend the Secretary of State for Scotland, of a committee to advise on certain aspects of this question.

Dr. ADDISON: Is it not a fact that this inquiry was into the nutrition of certain sections of the population and is there any reason why it should be secret?

Mr MACDONALD: It is one of the inquiries that I ask for from time to time to be undertaken by the Economic Advisory Council which the right hon. gentleman knows perfectly well makes reports on condition that they will not be published unless with its further consent. The report that was given was a very important one, a very interesting one at any rate and it has been referred for further inquiry on certain of its more important points.

Dr. ADDISON: It was perfectly possible to eliminate any matters which were confidential. Is it not of great importance that the findings of these scientists on the matter should be made public?

Mr. MACDONALD: The right hon. gentleman knows perfectly well the conditions under which the inquiries

are made. If it were subject to elimination and pruning the report that we published would not be the report originally given. The matter is under consideration.

Epitheliomatous Cancer

Mr. PARKINSON asked the Home Secretary the number of cases of epitheliomatous cancer where the date of disablement, as fixed by the certifying surgeon or medical referees, had been more than 12 months after the workman was last employed as a mill spinning operative.—Sir J. GILMOUR replied: I regret that this information is not available.

Mr. PARKINSON asked the Home Secretary the number of cases of epithelioma of parts of the body other than the scrotum, giving separate figures for each of the years 1929 to 1934, the geographical distribution of the reported cases, also stating the age analysis of all such cases in five-year periods—namely, up to 25 years of age, from 25 to 30 years, up to the age of 65, and over 65 years.—Sir J. GILMOUR replied: It would involve considerable time and labour to prepare statements in the form asked for, and as at present advised I do not think that this would be justified. If, however, the hon. Member will let me know the object of his inquiry I will consider how far I can assist him.

MONDAY, FEB. 18TH

Workmen's Medical Committee (Llanelly)

Mr. TEMPLE MORRIS asked the Minister of Health whether his attention had been called to the attempt of the workmen's medical committee at Llanelly to introduce medical practitioners with the object of reducing salaries; and whether this policy affected the arrangements for local national health insurance.—Sir HILTON YOUNG replied: I have seen references in the press to this matter. It has no relation to the arrangements for national health insurance.

Carriage of Dangerous Acids by Road

Major HILLS asked the Home Secretary when the revised regulations for the carriage of dangerous acids by road would be ready; whether he was aware that large quantities of such acids were now being transported by road, and that recently seven lorries containing carboys presumably filled with such acids were met with in a short distance on the Great North Road; whether he would bear in mind the disaster which occurred in 1933 at Boroughbridge owing to a collision with a lorry containing such acids; and therefore could he expedite the issue of such regulations.—Sir J. GILMOUR replied: I am not in a position at the moment to specify a date for the issue of the draft regulations; but I can assure the hon. Member that I fully appreciate the considerations to which he calls attention, and that, as I informed him on the 4th inst., all possible steps are being taken to expedite the matter.

Milk-supplies

Colonel BURTON asked the Minister of Agriculture if there had been any surplus of milk in excess of domestic and commercial requirements; if so, what had been the quantity; in what areas; and what was the method of its disposal.—Mr. ELLIOT replied: I am informed by the Milk Marketing Board that there has been no surplus of milk in excess of domestic and commercial requirements, and that all milk handled by the Board during the past year was, in fact, marketed.

TUESDAY, FEB. 19TH

Medical Referee and Workmen's Compensation

Mr. TINKER asked the Home Secretary if his attention had been drawn to the delay in getting cases of injured workmen who had been served with the statutory ten days' notice before the medical referee under the provisions of the Workmen's Compensation Act; and would he consider making it compulsory on the employer to continue paying compensation to the injured person until his case had been before the medical referee, as this would speed up the examination.—Sir JOHN GILMOUR replied: I do not appear to have received any complaints on this point. If the hon. Member will send me particulars of actual cases in which there seems to have been undue delay, I shall be glad to consider them.

Deaths from Anæsthetics

Mr. MCENTEE asked the Minister of Health the number of deaths that had occurred from anæsthetics during the past five years giving separate figures for each year.—Sir HILTON YOUNG replied: The information which is available in relation to deaths under or associated with anæsthesia in England and Wales is contained in the following tabular statement for the years 1929–33:—

1929	730	1932	749
1930	707	1933	768
1931	723		
		Total	3677

MEDICAL NEWS

Royal College of Surgeons of England

A meeting of the council was held on Feb. 14th, with Mr. Wilfred Trotter, the acting president, in the chair. A letter was read from the director-general of the Indian Medical Service asking the College to conduct a primary examination for the fellowship in India at the end of 1935. It was decided to hold an examination in Calcutta in December.

A diploma of fellowship was granted to Hugh Latimer Cleave and diplomas of membership to the candidates whose names were given in our issues of Feb. 9th and 16th, with the exception of S. H. Awad, M. C. Condillac, A. H. Khan, and Garthowen Williams. It was reported that, at the primary examination for the fellowship concluded on Jan. 2nd at Madras, the following candidates were successful:—

D. S. Ayyar, Madras; P. K. Chanmugam, Ceylon and Middlesex; K. K. Ghosh, Calcutta; S. K. Ghosh, Patna and St. Bart.'s; S. C. Gupta, Calcutta; P. S. Janardhanan, T. D. V. Krishnan, K. G. Krishnaswami, R. Mahadevar, C. K. P. Menon, and K. K. C. Nambiar, Madras; N. S. Narasimhan, Madras, Guy's, and King's Coll.; R. T. K. Nayar, Madras; H. R. Pasricha, Lahore; Chari Raghavachari, Madras; Choyi Raman, Madras and London; K. N. Rao, Madras; I. U. Shahab, Lahore; F. A. B. Sheppard, Melb.; Raghavachari Srinivasan, Madras; and S. P. Srivastava, Lucknow.

Diplomas in public health and medical radiology were granted, jointly with the Royal College of Physicians, to the candidates named in our issue of Feb. 9th.

It was decided that all applications for examinerships should reach the secretary at least ten days before the meeting of the council preceding that on which the election is to be made.

On the recommendation of the joint consultative committee it was decided that the College should oppose the Registration and Regulation of Osteopaths Bill in conjunction with the Royal College of Physicians, and that witnesses should be appointed to appear before the Select Committee of the House of Lords and give evidence. It was also decided that counsel be employed to act jointly on behalf of the two Royal Colleges.

It was reported that an election will be held on July 4th to fill the vacancies in the council occasioned by the retirement of Sir Cuthbert Wallace, Mr. Leonard Gamgee, and Mr. L. R. Braithwaite. Notice of the election will be given by advertisement and by circular on March 8th, and March 18th will be the last day for the nomination of candidates. A voting paper will be sent on April 2nd to every fellow whose address is registered at the College.

Society of Apothecaries of London

A Livery Dinner of the Society was held on Tuesday last when Dr. Wakelin Barratt, the deputy-master, presided in the absence of the Master, Sir George Buchanan. The dinner was an admirable one and the toast list, on the special instruction of the Master, was short, allowing the company time for pleasant conversation, following the ceremonies of dinner. After the loyal toasts, Sir William Willcox gave a cordial welcome to the guests for whose benefit, he said, despite the Master's instructions, he must say a few words about the constitution of the

Society. Briefly outlining the story of early association with the Grocers' Company and the charter of James I., he proceeded to give interesting information on the rights and privileges of the old city companies. Many of these still remained, even if unexercised; he believed that the Fishmongers' Company still had the right of personally inspecting fish in the London markets and rejecting what did not satisfy them, but he thought such procedure had now lapsed in favour of the sanitary authorities. Similar ancient rights might still pertain to the companies though unused. With regard to the Apothecaries, he pointed out that their particular privilege was that of sampling drugs and destroying those that were below the proper standard. These duties the company no longer exercised, but it discharged its duties to the public by turning out the all-round practical doctor fitly equipped for their service. Sir William then mentioned many of the guests present, saying that the Society welcomed with particular pleasure at their table Mr. R. C. Elmslie, Chairman of the Chartered Society of Masseurs and Medical Gymnasts; Sir Edwin Deller, Principal of the University of London; Sir Henry Dale, Director of the National Institute of Medical Research; Sir Arthur Hill, Director of the Royal Botanical Gardens, Kew; The Rev. A. C. Powell, Head Master of Epsom College; Mr. John Keall, President of the Pharmaceutical Society; Dr. Brincker, P.M.O., of the Public Health Department of the London County Council; and Mr. L. T. Moore, F.R.I.B.A., the Society's architect. He coupled the toast with the names of Sir Francis Fremantle, M.P., and Sir Arthur Hill.

Sir Francis Fremantle said the Society was living up to its long character by combining practical objects with academic attainment, and he congratulated the body on its decision to give a diploma in obstetrics where a higher level of accomplishment was clearly necessary. He urged that they should go on with their application of past wisdom to present needs, saying that this kind of practical progress was important at the present moment when the medical profession was being tried by its fruits. For he considered that it must be recognised by medical men that the public had obtained benefit from the ministrations of some outside the strictly medical pale.

Sir Arthur Hill concluded the evening's entertainment in a neatly humorous manner. He related the historic associations of the Royal Gardens at Kew, the Physic Garden at Chelsea, and the Society of Apothecaries, and told the audience that originally the authorities of the Physic Garden possessed a barge in which to make official visits and the site of its mooring could still be discerned. He thought that there was a good deal to be said for a proposal that the city companies, in this jubilee year of King George's reign, should again place official barges on the River Thames.

Hunterian Society

The society held its annual dinner at the Mayfair Hotel, London, on Thursday, Feb. 14th, to commemorate the 207th anniversary of the birth of John Hunter, the president, Dr. W. H. F. Oxley being in the chair. After the loyal toasts, the toast to the immortal memory of John Hunter was drunk in silence.

Mr. W. E. Tanner then proposed the toast of the Lord Mayor and the Corporation of the City of London, reminding his audience that the society was originally founded in the City of London and should thus cherish the honour of welcoming them. He also thanked the Lord Mayor for his kindness to the Hunterian orator and lecturer, Prof. John Eyre, thus setting the seal on the society and giving it pride and prestige. In reply the Lord Mayor said he had been reading regulations made for the practice of surgery 2000 years B.C., and had deduced that the doctor was the first to be called in in times of sickness and the last to be paid, and that only occasionally were doctors regarded in their true perspective and compensated for their work. The City was intimately connected with the medical profession in its activities in regard to public health, and much good work was being done at the Port of London by preventing the influx of infectious diseases.

The toast of The Society was proposed by the Earl of Halsbury, who confessed to having got up the history of John Hunter to meet the occasion. He found that he had this in common with Hunter in that when at school he too had on occasion refused to do lessons and incurred trouble, and even to-day he could not spell properly. Hunter, said the speaker, was a really great man. His powers of intuition were amazing, and he had brought into the work of the doctor and the surgeon order in many places where there had been chaos. There are some, said Lord Halsbury, who are seeking to be admitted to the medical profession without the necessary qualifications or training, and the osteopaths at that moment were asking for more than they were entitled to. There was need for registration of osteopaths and for their supervision by qualified medical men, when a great deal of good might be done by them. The President, in reply, said that the membership of the society, one of the oldest in the country, had increased and was increasing, and they were very proud of their connexion with the City of London, which was marked at one time by a membership composed mainly of medical men from the City, though medicine had now moved west. The dinner meetings of the society had proved a success. Hunter's message was, on one occasion at least, "Don't think, try," and Hunter tried. Most of the instruments to assist in precise diagnosis were not invented in his day, yet with his keen observation he was able to advance the science of medicine marvellously. Facts, he held, could only be obtained by observations, while deductions must only be made from facts. On these principles, laid down by Hunter, scientific medicine had been built up and it had changed the face of the world. Of the various medical cults that had been formed throughout the ages he said that they had this in common—they all set up the bogy that the medical profession was so hide-bound that it would listen to nothing that did not originate from its own members, whereas if anybody anywhere in any way found anything which would be of advantage to the ailing or the sick the medical profession had been the first to bring that something within the fold of medicine—when it lost its mystery, and mystery was one essential to these cults.

The toast of The Guests and Kindred Societies was proposed by Dr. Percy Spurgin, and replied to by Dr. Howard Stratford, president of the West London Medico-Chirurgical Society, and Mr. Douglas Woodruff, of the staff of the *Times*. Mr. Woodruff said he was glad an attempt was being made to stop osteopaths from signing birth and death certificates, for that was the prerogative of the *Times*, although moralists had resented their habit of putting the births before the marriages. He found it difficult to speak in a professional gathering, but he knew that doctors were well used to showing nothing but kindness and receiving nothing but thanks.

Dr. Oxley was supported in the chair by Dr. John Fairbairn, president of the British College of Obstetricians and Gynæcologists; Sir George Buchanan, Master of the Society of Apothecaries; Sir Walter Langdon Brown, regius professor of physic at Cambridge; the Master of the Cutlers' Company, the presidents of the Royal Society of Medicine, the Medical Society of London and of several other London medical societies, Dr. N. G. Horner and Sir Crisp English.

Conference on Meat

The food group and Liverpool section of the Society of Chemical Industry have arranged a symposium on meat to be held in the chemical department of the University of Liverpool on March 8th. Further particulars may be had from the head office of the society, Central House, Finsbury-square, London, E.C.2.

North Kensington Women's Welfare Centre

A public meeting has been arranged by this centre and will be held on Thursday, Feb. 28th, at 5.30 P.M., in the Kensington Town Hall, when the nation's responsibility for maternal health will be discussed. The speakers will include Dame Janet Campbell and Dr. Killick Millard. Lady Limerick will take the chair.

Instruction in the theory and practice of contraception will be given at the centre (12, Telford-road, Ladbroke-grove, London, W.) for post-graduates on March 13th, April 12th, May 13th, June 6th, and July 4th, and for medical students on March 22nd, April 4th, May 22nd, June 20th, and July 11th. The lecturers will be Dr. Mary Redding, Dr. Lynette Hemmant, Dr. Cecile Booysen, and Dr. Helena Wright. Further particulars from the secretary.

University of Manchester

Dr. Donal Sheehan has been appointed lecturer in neuro-anatomy in the University.

Food Education Society

Three lectures will be given by Dr. Clement Nicory for this society at the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., at 5.15 P.M., on consecutive Tuesdays, from March 12th to 26th. The subjects will be rheumatism, malnutrition, and obesity, and the chief causes of ill-health. The address of the society is 29, Gordon-square, W.C.1. No ticket is needed for the lectures.

Fracture Units at Hospitals

The Ministry of Health has been furnished with copies of the report of the British Medical Association's committee on fractures, and has sent copies to county councils and county borough councils in England and Wales and to their medical officers of health. In an accompanying circular it is suggested that councils which are considering the question of organising "fracture units" at one of their hospitals should consult with the authorities of the voluntary hospitals serving their area.

A Congress on Thalassotherapy

The seventh congress of the Association Internationale de Thalassothérapie, which is concerned with the medical use of seaside resorts and sea-water, will be held at San Sebastian, Spain, from July 27th to 30th. The subjects chosen for discussion are the treatment of cervical adenitis and indications and counter-indications for sun-bathing. The secretary of the congress may be addressed at Place du Bon Pasteur 20, Saint Sebastien.

Medical Practice in China

The Chinese National Health Administration has issued a notice stating that foreign medical practitioners should obtain licences from the Administration, their bona fides being guaranteed by the consular authorities. They are expected to learn Chinese, and before setting out for China should apply to the permanent Chinese delegation of the League of Nations at Geneva.

Sir Charles Hastings Lecture

The lectures named in memory of Sir Charles Hastings were inaugurated by the British Medical Association in order to provide information on matters of general public health interest. The seventh of the series will be given in the Great Hall of the Association's house in Tavistock-square, London, at 8 P.M. on Tuesday, March 12th, when the lecturer will be Sir Walter Langdon Brown, regius professor of physic in the University of Cambridge, and the subject Art and Fashion in Medicine. Lord Snell, chairman of the London County Council, will preside, and tickets may be had free on application to the financial secretary of the Association.

Course on Mental Deficiency

A course of lectures on mental deficiency and allied conditions has been arranged for medical practitioners by the extension and tutorial classes council of the University of London in coöperation with the Central Association for Mental Welfare. The course, which will be supplemented by clinical instruction, is divided into two parts (mental deficiency, May 13th–18th; retarded and difficult children, May 20th–25th), and these may be taken separately. Applications should reach Miss Evelyn Fox, University Extension Department, University of London, Imperial Institute-road, S.W.7, before April 23rd.

A Library of Orthopædic Surgery

At a meeting of the Liverpool Medical Institution held on Feb. 7th, Mr. T. P. McMurray, after reading a paper on the life of Hugh Owen Thomas, announced that the institution had determined to commemorate his work and that of Sir Robert Jones by forming a Hugh Owen Thomas and Robert Jones Library of Orthopædic Surgery. An appeal is made for contributions to form the nucleus of what it is hoped will come to be a complete orthopædic library. Books and articles should be sent to the Librarian at the Medical Institution, Liverpool.

Blackpool Hospital

A public appeal is being made for assistance in building, equipping, and endowing the new hospital at Stanley Park. The sum of £165,000 is needed.

Course in Plastic Surgery

The second course in plastic surgery, which has been arranged by the Alliance Scientifique et Médicale Française, will be held from March 29th to April 15th, and is to take the form of a tour of Paris, Prague, Vienna, and Milan There will be opportunities of seeing the work being done at each centre. Further information may be had from Dr. Claoué, 39, Rue Scheffer, Paris, XVI.

Microchemical Club

The annual general meeting of the Microchemical Club will take place on Saturday, March 16th, at 10.30 A.M., in the London School of Hygiene and Tropical Medicine, Keppel-street, London, W.C. Prof. H. V. A. Briscoe will take the chair. The hon. secretary may be addressed at the National Institute for Research in Dairying, Shinfield, Reading.

Lady Tata Memorial Research Scholarships

At least two of these scholarships are expected to be vacant in October and applications are invited from suitably qualified men or women of any nationality who wish to undertake research work in diseases of the blood with special reference to the leukæmias. Further particulars will be obtained from our advertisement columns and from the secretary of the scientific advisory committee, 138, Bedford-court Mansions, London, W.C.1.

Maternity and Child Welfare Conference

A national conference on maternity and child-welfare will be held at the County Hall, Westminster, and in the Queen Mary Hall, Great Russell-street, W.C., from July 1st to 3rd. It is being organised for the National Council for Maternity and Child Welfare by the National Association for the Prevention of Infant Mortality in coöperation with the maternity and child welfare group of the Society of Medical Officers of Health, which will also hold a short clinical course for medical practitioners on June 29th and 30th. The subject for discussion throughout the conference will be various aspects of the care of the child from two to five years of age. The hon. secretary of the conference is Miss Halford, 117, Piccadilly, London, W.1.

Incineration of Refuse

A party of medical officers of health and others interested in public health visited Brighton last Saturday as the guests of Mr. Frank Evans in order to inspect the Feoenix incineration plant at Sheepcote Valley, of which he is the inventor. In the Feoenix method, which was described in our issue of Dec. 8th, 1934 (p. 1321), the contents of refuse lorries are side-tipped direct into a trench without any human handling. In the trench they fall on to a grate and are lit from below. The trench covers are then shut down, and incineration takes from 12 to 48 hours, according to the nature of the refuse. Finally, the incinerated material falls into a truck and the residuals are removed. The fire in the Brighton plant was started on Feb. 2nd, 1933, and has never been out. Thirty tons of refuse has been disposed of per week and the plant has been working to only half its capacity. There has bee n no trouble of any kind. Recently Brighton corporation decided to increase the size of the plant by 150 per cent. and in future it will be possible to handle something like 150–180 tons a week. The residual converted refuse amounts to approximately 16 per cent. of the bulk of the refuse put into the trench. Hitherto it has been used for roadmaking, but the ash has been estimated to be worth 25s. to £2 per ton. This process of incineration is said to be complete as far as organic matter is concerned and the inorganic matter is fire-purged and hygienic. It was stated that to erect a plant similar to the Brighton one to-day, but with many improvements which have been evolved during the trial period, would cost in all £2200. The only working expense is the wage of the one man who looks after it.

Those present included Sir Cooper Rawson, M.P., Captain G. S. Elliston, M.P., Sir Allan Powell, Dr. James Fenton, Dr. Charles Porter, and Dr. N. G. Horner. Dr. Duncan Forbes, M.O.H. for Brighton, in commenting on the Feoenix method, quoted the borough engineer as saying that "it is 100 per cent. efficient." Dr. Forbes was quite sure that it was "a most excellent system under a great many circumstances," and he believed that under certain circumstances it was better than any other.

Medical Diary

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
MONDAY, Feb. 25th.
Odontology. 8 P.M. Mr. R. A. Broderick: Concealed Clefts of the Palate in Hare-lip. Mr. J. G. Turner: Two Cases of Impacted Lower Third Molars. Dr. E. W. Assinder: Manifestations of Venereal Diseases in the Mouth and Face. Members of the Section of Dermatology are invited.
TUESDAY.
Medicine. 5 P.M. Prof. E. Meulengracht: The Stomach, especially the Pyloric Glands, in Relation to Pernicious Anæmia. Other speakers: Dr. A. F. Hurst and Prof. L. J. Witts.
WEDNESDAY.
Comparative Medicine. 5 P.M. Dr. C. H. Andrewes, Mr. J. T. Edwards, and Major T. Dalling: Influenza.
THURSDAY.
Urology. 8.30 P.M. Mr. E. G. Muir: The Prognosis of Malignant Renal Tumours. Mr. C. A. Wells: Diagnosis of Stone by X Rays. Mr. E. W. Riches: Some Landmarks in the Surgery of Stone.
FRIDAY, March 1st.
Otology. 10.30 A.M. (Cases at 9.30 A.M.) Mr. Thacker-Neville, Dr. Albert Gray, and Dr. C. M. Hinds Howell: Diagnosis of Senile Deafness and its Amelioration.
Laryngology. 5 P.M. (Cases at 4 P.M.) Prof. Berven, Mr. Stanford Cade, and Dr. F. M. Allchin: Distant Radiation for New Growths of the Upper Respiratory Tract.
Anæsthetics. 8.30 P.M. Dr. Reginald Ironside: An Explosion during Administration of an Anæsthetic. Prof. G. I. Finch: Electrical Ignition of Gases.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W.
MONDAY, Feb. 25th.—8.30 P.M., Mr. Geoffrey Keynes and Mr. E. Pearce Gould: Value and Limitations of Radium Therapy.
WEDNESDAY.—9 P.M., Mr. J. E. H. Roberts: The Surgery of Pleural and Pulmonary Infections. (Second Lettsomian lecture.)

ST. JOHN'S HOSPITAL DERMATOLOGICAL SOCIETY, 49, Leicester-square, W.C.
WEDNESDAY, Feb. 27th.—4.15 P.M., Clinical Cases.

MEDICO-LEGAL SOCIETY.
THURSDAY, Feb. 28th.—8.30 P.M. (11, Chandos-street, W.), Major G. Burrard: Identification of Firearms in Murder Cases by Microscopic Examination of Fired Bullets and Cartridge Cases.

BRITISH PSYCHOLOGICAL SOCIETY.
WEDNESDAY, Feb. 27th.
Medical Section. 8.30 P.M. (Institute of Medical Psychology, Malet-place, W.C.), Prof. W. Mayer-Gross: Depersonalisation.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY, West London Hospital.
FRIDAY, March 1st.—8.45 P.M. (Cases at 8 P.M.) Clinical and Pathological Meeting.

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION.
THURSDAY, Feb. 28th.—3 P.M. (1, Wimpole-street, W.), Dr. Lewis C. Bruce: Observations on the Physical Symptoms of Acute and Confusional Insanity.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.
THURSDAY, Feb. 28th.—Dr. E. H. R. Harries: Infection and its Control in Children's Wards. (First Milroy lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, Feb. 25th, to SATURDAY, March 2nd.—PRINCE OF WALES'S HOSPITAL, Tottenham, N. All-day course in Medicine and Surgery.—ST. JOHN'S HOSPITAL, Leicester-square, W.C. Afternoon course in dermatology. (Open to all.)—PRINCESS ELIZABETH OF YORK HOSPITAL, Shadwell, E. Week-end course in children's diseases.—WELLCOME MUSEUM OF MEDICAL SCIENCE, Euston-road, N.W. Thurs., 3 P.M., Dr. W. Smith: Pathological Demonstration on Tuberculosis.—NATIONAL TEMPERANCE HOSPITAL, Hampstead-road, N.W. Tues., 8 P.M., Mr. C. Naunton Morgan: Large Intestine and Rectum. Thurs., 8 P.M., Mr. A. M. A. Moore: Injuries to Joints, Muscles, and Tendons.—Courses, clinics, &c., arranged by the Fellowship are open only to Members and Associates.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.
MONDAY, Feb. 25th.—Noon, Dr. W. W. Payne: The Biochemical Aspects of Endocrine Disorders.
WEDNESDAY.—2 P.M., Dr. R. T. Brain: Treatment of Eczema in Children.
THURSDAY.—Noon, Dr. A. Signy: The Examination of the Blood.
FRIDAY, March 1st.—Noon, Mr. H. A. Apperley: Irregularity of Teeth in Children.
There will be out-patient clinics every day at 10 A.M. and ward visits (except on Wednesday) at 2 P.M.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE, Hammersmith, W.
MONDAY, Feb. 25th.—10 A.M., medical wards, skin clinic. 2 P.M., surgical wards, gynæcological wards, eye and gynæcological clinics. 4.15 P.M., Mr. Green-Armytage: Abortion.
TUESDAY.—10 A.M., medical wards. 11 A.M., surgical wards. 2 P.M., throat clinic. 4.15 P.M., Mr. Hamblen Thomas: Treatment of Nasal Sinusitis.
WEDNESDAY.—10 A.M., children's clinic. 11 A.M., surgical wards. 2 P.M., medical wards, eye clinic. 4.15 P.M., Mr. Curnock: Diseases of Teeth and Gums.
THURSDAY.—10 A.M., gynæcological and neurological clinics. 11.30 A.M., fracture demonstration. 2 P.M., eye and genito-urinary clinics.
FRIDAY, March 1st.—10 A.M., skin clinic. Noon, lecture on treatment. 2 P.M., throat clinic. 4.15 P.M., Dr. Redvers Ironside: Intracranial Vascular Disease.
SATURDAY.—10 A.M., children's and surgical clinics, medical wards.
Daily at 2 P.M., Operations, medical and surgical clinics. Lectures at 4.15 P.M. are open to all medical practitioners without fee.

NATIONAL HOSPITAL, Queen-square, W.C.
MONDAY, Feb. 25th.—3.30 P.M., Mr. Leslie Paton: Papilœdema and Optic Atrophy.
TUESDAY.—3.30 P.M., Dr. Critchley: Cerebral Vascular Disease.
WEDNESDAY.—3.30 P.M., Dr. Martin: Clinical Demonstration.
THURSDAY.—3.30 P.M., Dr. Gordon Holmes: Neurosyphilis.
FRIDAY, March 1st.—3.30 P.M., Dr. Carmichael: Peripheral Neuritis.
Out-patient clinic daily at 2 P.M.

CANCER HOSPITAL (FREE), Fulham-road, S.W.
THURSDAY, Feb. 28th.—4 P.M., Dr. H. W. Gordon: Rodent Ulcer and its Treatment.

HOSPITAL FOR EPILEPSY, Maida Vale.
THURSDAY, Feb. 28th.—3 P.M., Dr. F. L. Golla: Demonstration.

CENTRAL LONDON THROAT, NOSE AND EAR HOSPITAL, Gray's Inn-road, W.C.
FRIDAY, March 1st.—4 P.M., Mr. Archer Ryland: Demonstration of Museum Specimens.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL, N.W.
WEDNESDAY, Feb. 27th.—4 P.M., Dr. H. M. Oddy: Some Diseases of the Colon.

LONDON SCHOOL OF DERMATOLOGY, 49, Leicester-square, W.C.
TUESDAY, Feb. 26th.—5 P.M., Dr. H. C. G. Semon: Diseases of the Buccal Mucous Membrane.
THURSDAY.—5 P.M., Dr. A. Burrows: Malignant Conditions of the Skin.

BRITISH RED CROSS CLINIC FOR RHEUMATISM, Petoplace, N.W.
THURSDAY, Feb. 28th.—8.30 P.M., Dr. C. B. Heald: Relationship of Sport Injuries and Rheumatism.

SOUTH-WEST LONDON POST-GRADUATE ASSOCIATION, St. James' Hospital, Ouseley-road, S.W.
WEDNESDAY, Feb. 27th.—4 P.M., Dr. C. E. Lakin: Demonstration of Medical Cases.

KING'S COLLEGE HOSPITAL MEDICAL SCHOOL, Denmark-hill, S.E.
THURSDAY, Feb. 28th.—9 P.M., Dr. S. A. K. Wilson: Pains in the Lower Limbs.

ANCOATS HOSPITAL, Manchester.
THURSDAY, Feb. 28th.—4.15 P.M., Dr. W. J. S. Reid: Hysteria.

PUBLIC DISPENSARY, Leeds.
WEDNESDAY, Feb. 27th.—4 P.M., Mr. A. D. Sharp: Tonsils and Adenoids; Present-day Views.

GENERAL HOSPITAL, Newcastle-upon-Tyne.
SUNDAY, Feb. 24th.—10.30 A.M., Prof. Beattie: Medical Ward Visit.

GENERAL INFIRMARY, Leeds.
TUESDAY, Feb. 26th.—3.30 P.M., Dr. Tattersall: Demonstration of Cases of Pulmonary Tuberculosis.

ROYAL INFIRMARY, Manchester.
TUESDAY, Feb. 26th.—4.15 P.M., Mr. F. G. Wrigley: Suppuration in the Maxillary Antrum; Diagnosis and Treatment.
FRIDAY, March 1st.—4.15 P.M., Mr. H. H. Rayner: Demonstration of Surgical Cases.

GLASGOW POST-GRADUATE MEDICAL ASSOCIATION.
TUESDAY, Feb. 26th.—3.30 P.M. (Faculty Hall, 242, St. Vincent-street), Dr. J. W. S. Blacklock: The Acute Abdomen in Infancy and Childhood.
WEDNESDAY.—4.15 P.M. (Ear, Nose and Throat Hospital), Dr. W. S. Syme: Ear, Nose, and Throat Cases.

INDEX TO "THE LANCET," VOL. II., 1934

THE Index and Title-page to Vol. II., 1934, which was completed with the issue of Dec. 29th, is now ready. A copy will be sent gratis to subscribers on receipt of a postcard addressed to the Manager of THE LANCET, 7, Adam-street, Adelphi, London, W.C.2. Subscribers who have not already indicated their desire to receive Indexes regularly as published should do so now.

Appointments

EVANS, L. P. J., M.B. Camb., F.R.C.S. Eng., D.O.M.S., has been appointed Assistant Ophthalmic Surgeon to the Children's Hospital, Birmingham.

HALL, EDITH, M.D. Lond., F.R.C.S. Eng., M.C.O.G., Assistant Surgeon to the South London Hospital for Women.

HARRIS, T. A. B., M.B. Melb., Hon. Anæsthetist to Guy's Hospital.

HOWELLS, L. HAYDN, M.D., M.R.C.P. Lond., Hon. Assistant Physician to the Cardiff Royal Infirmary.

MCCONNELL, W. S., M.B. Lond., Hon. Anæsthetist to Guy's Hospital.

PAGE, A. P. MENZIES, M.D., M.R.C.P. Lond., Resident Medical Officer to the Royal Masonic Hospital.

WELTON, F. J., M.B. Liverp., D.P.H., Assistant Medical Officer of Health to the County Borough of Walsall.

London County Council Hospital Staff.—The following appointments are announced. A.M.O. = Assistant Medical Officer; Temp. = Temporary.

BEADLES, J. N., M.B. Lond., A.M.O.;
LLEWELLIN, D. M., M.D., D.P.H., A.M.O.; and
BANKS, A. L., M.D. Lond., D.P.H., Temp. Divisional Medical Officer.

Certifying Surgeon under the Factory and Workshop Acts: Dr. F. H. STUTTAFORD (Winchester, Hants).

Vacancies

For further information refer to the advertisement columns

All Saints' Hospital, Austral-street, S.E.—Res. H.S. At rate of £100.

Auckland, New Zealand, General Hospital.—Radiologist. £850.

Bangor, Caernarvonshire and Anglesey Infirmary.—H.P. and H.S. Each at rate of £125.

Belfast, Royal Maternity Hospital.—Res. M.O. At rate of £26.

Birmingham and Midland Hospital for Women.—H.S. At rate of £100.

Birmingham, Little Bromwich Hospital for Infectious Diseases.—Jun. Asst. M.O. £300.

Birmingham University.—Lecturer in Bacteriology and Asst. Bacteriologist. £400.

Bournemouth, Royal National Sanatorium for Consumption, &c.—Asst. Res. M.O. £200.

Bradford Municipal General Hospital, St. Luke's.—H.P.'s. and H.S.'s. Each at rate of £150.

Bradford Royal Infirmary.—H.S. At rate of £135.

Brighton, Royal Alexandra Hospital for Sick Children.—Hon. Asst. Surgeon.

Brighton, Royal Sussex County Hospital.—H.S. £150. Also Cas. H.S. £120.

Bristol University.—Lectureship in Anatomy.

Cambridge.—Three Tancred's Studentships. Each £100.

Cambridge, Addenbrooke's Hospital.—H.S. at rate of £150.

Cardiff, Welsh National School of Medicine.—Asst. Lecturer in Dept. of Materia Medica, &c. £500.

Dewsbury and District General Infirmary.—Sen. H.S. £200.

Dudley, Guest Hospital.—H.S. Also second H.S. £200 and £170 respectively.

East Ham Memorial Hospital, Shrewsbury-road, E.—Pathologist (Half-time). £300–£350. Also H.S. to Spec. Depts. and Cas. O. At rate of £120.

Gloucester Royal Infirmary, &c.—H.S. At rate of £150.

Halifax Royal Infirmary.—Third H.S. £150. Also Two Visiting Anæsthetists.

Halifax, St. Luke's Hospital.—Jun. Res. M.O. At rate of £250.

Harrogate and District General Hospital.—H.P. and Cas. O. Each at rate of £150.

Hastings County Borough.—Deputy M.O.H., Deputy School M.O., &c. £600.

Hospital for Sick Children, Great Ormond-street, W.C.—Surgeon. Also Physician to Out-Patients.

Huddersfield Royal Infirmary.—H.S. At rate of £150.

Hull Royal Infirmary.—H.S. to Ophth. and Ear, Nose, and Throat Dept. Also Third H.S. Each at rate of £150.

Institute of Medical Psychology, Malet-place, W.C.—Part-time Psychotherapist. £200. Also Part-time Pathologist.

Ipswich, East Suffolk and Ipswich Hospital.—Visiting Staff.

Kingston-upon-Hull, Anlaby-road Institution.—Asst. M.O. £350.

Lady Tata Memorial Research Scholarships in Medicine.—Each £400.

Lambeth Hospital, Brook-street, S.E.—Asst. M.O. £350.

Leicester Royal Infirmary.—Res. H.S.'s, H.P.'s, Cas. O. Also Jun. Res. Anæsthetists. Each £125. Also Jun. Cas. O. £100.

Liverpool, Alder Hey Children's Hospital.—Res. Asst. M.O.'s. Each £200.

Liverpool, Mill-road Infirmary.—Deputy Med. Supt. £450. Res. Asst. M.O. £200. Also Asst. V.D. M.O. £400.

Liverpool Royal Babies' Hospital.—Res. M.O. At rate of £90.

Liverpool, Smithdown-road, Hospital.—Res. Asst. M.O. £200.

Liverpool, Walton Hospital.—Res. Asst. M.O. £200.

Manchester, Ancoats Hospital.—Two H.S.'s. Each at rate of £100.

London Hospital, E.—Surg. First Asst. and Reg. £300.

Manchester Hospital for Consumption, &c.—Asst. M.O. for Crossley Sanatorium. £200.

Manchester, Hulme Dispensary.—Hon. Physician.

Manchester Northern Hospital.—Hon. Aurist and Laryngologist. Hon. Asst. Surgeon. Hon. Asst. Phys. for Children, 2 Hon. Phys. Also Res. Surg. O. £150.

Manchester, Royal Children's Hospital.—Two Asst. M.O.'s. Each at rate of £150.

Marie Curie Hospital, 2, Fitzjohn's-avenue, N.W.—Res. M.O. At rate of £100.

Melton, Suffolk, St. Audry's Hospital.—Jun. Asst. M.O. £350.

Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen. and Jun. Res. M.O.'s. At rate of £140 and £100 respectively.

Miller General Hospital.—Hon. Dental Surgeon.

Newark General Hospital.—Res. H.S. £175.

Norwich, Jenny Lind Hospital for Children.—Res. M.O. £120.

Prince of Wales's General Hospital, N.—Jun. H.P. Also two Jun. H.S.'s. Each at rate of £90.

Princess Beatrice Hospital, Richmond-road, Earl's Court, S.W.—H.S. and Cas. O. Each at the rate of £110.

Queen's Hospital for Children, Hackney-road, E.—H.P. and Two Cas. O.'s. Each at rate of £100.

Royal Eye Hospital, St. George's-circus, S.E.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively. Also Part-time Pathologist. £100.

Royal Free Hospital, Gray's Inn-road, W.C.—Res. Cas. O. At rate of £150.

Royal National Orthopædic Hospital, Great Portland-street, W.—Two H.S.'s. Each at rate of £150.

Royal Naval Medical Service.—Ten M.O.'s.

Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Clin. Asst.

Smethwick County Borough.—Res. M.O. for St. Chad's Hospital, and Asst. M.O.H. £350.

Southend-on-Sea General Hospital.—H.S. At rate of £100.

South London Hospital for Women, Clapham Common, S.W.—H.P. and H.S. Each at rate of £100.

St. Bartholomew's Hospital, E.C.—Chief Asst. to X Ray Diagnostic Dept.

St. John Clinic, 42, Ranelagh-road, S.W.—Hon. Dental Surgeon Also Hon. Ear, Nose, and Throat Surgeon.

St. John's Hospital for Diseases of the Skin, 49, Leicester-square.—Med. Regs. to Out-patients and In-patients.

St. Leonards-on-Sea, Buchanan Hospital.—Jun. H.S. At rate of £125.

St. Pancras Hospital, Pancras-road, N.W.—Asst. M.O. £350.

St. Peter's Hospital for Stone, &c., Henrietta-street, W.C.—H.S. At rate of £75.

Stockwell College, The Old Palace, Bromley.—M.O. £100.

St. Thomas's Hospital Medical School, S.E.—Lecturer and Deputy-Director in Anatomy. £600.

Sheffield, Jessop Hospital for Women.—Res. M.O. At rate of £150.

Sheffield Royal Infirmary.—Clin. Asst. to Med. Dept. £300.

Ventnor, I. of W., Royal National Hospital for Consumption, &c.—Jun. Asst. Res. M. O. At rate of £300.

Watford and District Peace Memorial Hospital.—H.S. At rate of £150.

Weir Hospital, Grove-road, Balham, S.W.—Sen. Res. M.O. Also Jun. Res. M.O. £200 and £150 respectively.

West London Hospital, Hammersmith-road, W.—H.P., H.S. Also H.S. to Throat Nose, and Ear Dept. Each at rate of £100. Also Hon. S.

Westminster Hospital, Broad Sanctuary, S.W.—Obstet. Tutor and Reg. £50.

Wolverhampton. New Cross Hospital.—Asst. Res. M.O. £200.

Medical Referee under the Workmen's Compensation Act, 1925 for the Beverley, Bridlington, Goole, Great Driffield, Kingston-upon-Hull, Pocklington, and Selby County Court Districts (Circuit No. 16). Applications should reach the Private Secretary, Home Office, Whitehall, London, S.W.1, before March 9th, 1935.

Births, Marriages, and Deaths

BIRTHS

ARMSON.—On Feb. 11th, at Yoxall, Burton-on-Trent, the wife of Gerald Armson, M.R.C.S. Eng., of a daughter.

CORMACK.—On Feb. 14th, at a nursing-home, Ayr, the wife of Dr. Robert Cormack, M.B., Ch.B. Edin., F.R.C.S. Edin. Ayr, of a son.

HANCOCK.—On Feb. 13th, at Stoke Mandeville, Bucks, the wife of F. R. Thompson Hancock, M.R.C.S. Eng., of a daughter.

HICKS.—On Feb. 13th, at Dyke-road, Brighton, the wife of Leighton Hicks, M.B. B.S., Lond., of a daughter.

HUMBLE.—On Feb. 11th, at East Molesey, Surrey, the wife of J. W. M. Humble, M.B., Ch.B. Glasg., D.P.H., of a son.

MITCHESON.—On Feb. 8th, the wife of V. S. Mitcheson, M.R.C.S. Eng., Lyminge, Folkestone, of a son.

MARRIAGES

BUTCHER—RINALDI.—On Feb. 9th, at Mariastein, Surgeon-Commander Walter Herbert Butcher, M.D. Oxon., R.N.V.R., to Marie, elder daughter of A. Rinaldi and of Frau Rinaldi, of Schönenwerd, Soleure.

COAKER—ELKINGTON.—On Feb. 9th, in London, Edward Carey Coaker, M.B., B.Ch. Oxon, of Hitchin, to Isabel Frances Elkington, of Bude.

DEATHS

DRAKE LEE.—On Jan. 20th, 1935, at Avenue House, Kettering, Northants, Daniel Drake Lee, M.D., R.U.I., beloved husband of Jennie Drake Lee. Fortified by the Rites of the Holy Church. R.I.P. (Irish papers, please copy.)

JONES.—On Feb. 14th, at Langstone Court, Glewstone, Hereford, Thomas Joseph Jones, M.B., C.M. Edin., M.R.C.S. Eng., J.P., aged 78 years.

SLADEN.—On Feb. 15th, at Folkestone, Reginald J. Lambart Sladen, F.R.C.S. Eng., D.P.H., R.C.P. Lond., of Carshalton, in his 59th year.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

NATIONAL COUNCIL FOR MENTAL HYGIENE

WE have received from the National Council for Mental Hygiene the following recommendations for the treatment of voluntary patients under the Mental Treatment Act, 1930. They have been drawn up by the Council.

1. The mental hospital can afford treatment facilities for the voluntary patient, provided there is available a special treatment unit, detached from the main hospital buildings.

2. Successful treatment depends upon the construction and the adequate medical staffing of the treatment unit.

3. It is essential that this treatment unit should be so arranged that suitable grading of patients is ensured, in other words, that the disturbed patient should not be in proximity to the patient in need of rest and quiet.

4. Only patients who are accessible to active remedial treatment, psychological or physical, should be permitted to reside in the treatment unit.

5. The medical officer in charge of the treatment should be a senior man or woman fully qualified to carry out modern methods of treatment, both psychological and physical. In order that his energies may not be dissipated he should neither have to supervise the welfare of chronic patients nor be burdened with administrative duties. Moreover, he should be supported in his therapeutic activities by assistants, preferably part-time.

6. It would be inexpedient at present to provide accommodation for the voluntary patients other than at the treatment unit of the mental hospital.

7. The provision of well-constructed, well-staffed treatment units will help to break down the popular prejudice which still exists in relation to mental hospitals.

8. In any discussion of the voluntary patient it should always be kept in mind that included in this category are psychotic patients who, were it not for the Mental Treatment Act, would require to be certified.

9. It is recognised that although in a few mental hospitals these principles are applied, in general they are not adopted throughout the country and it is considered advisable therefore to advocate that propaganda should be developed to achieve their acceptance and practice.

10. The treatment unit within the mental hospital should be regarded as a practical solution of the voluntary patient problem *for the time being*, but should not be considered as necessarily permanent and final.

11. It is suggested that every university town should endeavour to establish a teaching hospital under the control of a part-time director who should be professor of psychiatry at the university.

The committees through which the document has passed comprise superintendents of mental hospitals, past and present, assistant medical officers of mental hospitals, psychotherapists of various schools, mental hospital visitors, justices of the peace, and social workers. The recommendations, therefore, may be regarded as a serious contribution from both the professional and lay standpoint.

ENRICO BOTTINI

IN the issue of *Il Policlinico* of Jan. 14th there is a short article by Dr. V. Marino, first assistant at the bacteriological laboratory attached to the public health department in Rome, questioning the priority of Lister in the use of carbolic acid in antiseptic surgery, and setting out the claims in this direction of Enrico Bottini a prominent worker in the medical school of Pavia. He quotes an article which appeared in THE LANCET of 1867 written by Lister as being the first record by the discoverer himself of the virtues of the antiseptic, but says that in a monograph published by Bottini a year before, the value of carbolic acid in practical surgery had been demonstrated. An interesting résumé is given by Dr. Marino of the early work of other surgeons, French, Italian, and British, and the results obtained by the use of carbolic acid under Lemaire's hands are alluded to. Consultation of Sir Rickman Godlee's extraordinarily careful and detailed biography of Lord Lister shows exactly on what grounds Lister must always be regarded by scientific men as the father of antiseptic surgery, and the earliest use of carbolic acid is not the real question at issue. The antiseptic and disinfectant properties of coal tar were recognised some years before Joseph Lister was born, while 20 years before he first wrote on the therapeutics of carbolic acid F. C. Calvert, professor of chemistry at the Royal Institution, Manchester, described carbolic acid as a recognised and powerful disinfectant. (Dr. Marino appears to place the date considerably later.) Lister did not know of Jules Lemaire's writings until a year after the publication of the original article in THE LANCET of 1867. When, in a curious way recorded in THE LANCET, he became aware of Lemaire's work he wrote pointing out that the principles of antiseptic surgery did not depend on the use of carbolic acid, though he had selected that medium because its powerful properties were known. There is no doubt that Enrico Bottini made valuable use of carbolic acid as a disinfectant, but he was not a pioneer in the introduction of antiseptic surgery.

PRICE OF INSULIN

WHEN insulin was first discovered 12 years ago it could not be sold at less than 25*s*. per 100 units. Boots Pure Drug Company announce that as from Monday, Feb. 11th, their price for insulin will be 1*s*. for a 5 c.cm. phial of 100 units, the price hitherto standing at 1*s*. 4*d*. The firm inform us that the special low price now charged to hospitals will be still further reduced, the level thus being substantially below that of imported Insulin.

The reduction in price from 25*s*. to 1*s*., brought about in 12 years, is a striking tribute to the practical value of medical research to the public. Messrs. Boots were prompt in commencing their efforts in this direction, as their representatives got into touch with Prof. Banting, in Canada, as soon as the discovery was announced. From that time forward improvements in methods of manufacture have made possible reductions in price, until the present figure has been reached, and we understand that arrangements for large scale manufacture have now been completed.

AN INFRA-RED GENERATOR

THE "Grosvenor" infra-red generator is designed by the Medical Supply Association Ltd. for treatment with long infra-red rays without admixture of luminous rays. The element is described by the makers as a solid black-body generator enveloped in a metallic casing, consuming 500 watts per hour (2 amps. at 250 volts). The emission ranges from 20,000 to 160,000 A., with maximum emission at 50,000 A. The floor-stand allows adjustment of the element at any angle desired. It is claimed that elimination of visible radiation diminishes unpleasant burning sensation on warming of tissues. This point may be disputed, but it will be readily acknowledged that a source of infra-red emission without admixture of visible red rays may be a useful adjuvant to local treatment, and this apparatus possesses many features to recommend it.

ERRATUM.—On p. 72 of our issue of Jan. 12th Dr. L. J. Harris and Dr. S. N. Ray, in describing their method of estimating ascorbic acid, wrote: "The dye is made up in watery solution, at a strength of about 0·05 per cent., so that 0·05 c.cm. is equivalent to roughly 0·025 mg. of ascorbic acid." This should read: "The dye is made up in watery solution, at a strength of about 0·10 per cent., so that 0·05 c.cm. is equivalent to roughly 0·025 mg. of ascorbic acid."